Vol. 887 Number 4

# OFFICIAL GAZETTE

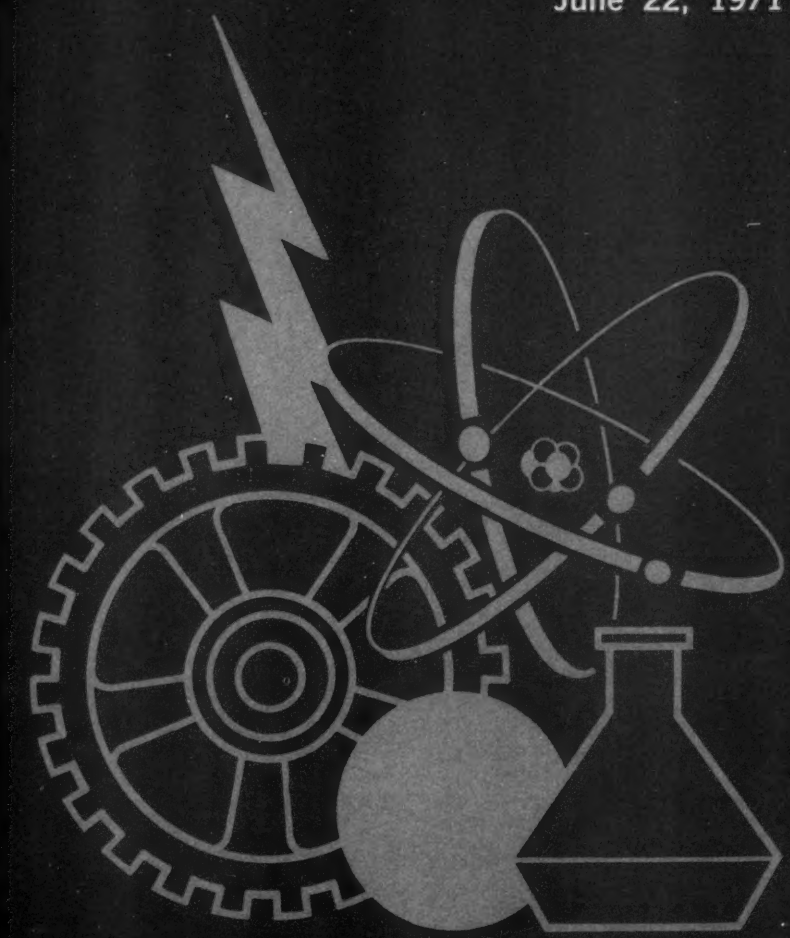
of the
UNITED STATES PATENT OFFICE

SEP

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

June 22, 1971



U. S. DEPARTMENT OF COMMERCE
Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

June 22, 1971 Volume 887 Number 4

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# PATENT OFFICE NOTICES

## Certified Copies of Applications as Originally Filed

The Patent Office has discontinued placing the assignments of record on the file wrapper of patent applications, except when a title report is requested or upon allowance of the case. Accordingly, the copies of applications prepared in response to requests for a certified copy of a patent application as filed, will no longer include an indication of assignments. Applicants desiring an indication of assignments of record should request separately certified copies of assignment documents.

ROBERT J. RISH,
*Acting Assistant Commissioner for Administration.*

## Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

**2,129,332,** D. Mastini, TELEPHONE SYSTEM, **filed** Nov. 23, 1965, D.C. Md. (Baltimore), Doc. 16899, *Domenico Mastini* v. *American Telephone and Telegraph Company and Western Electric Company.* Opinion and order of the Court granting defendants motion to dismiss; judgment in favor of defendants, Dec. 2, 1970.

**2,629,134,** R. P. Molitor, METHOD OF MANUFACTURING ARTICLES FROM VINYL RESINS, **filed** Sept. 27, 1968, D.C., N.D. Ill. (Chicago), Doc. 68c1788, *J. A. Dubow Manufacturing Co.* v. *Sun Corporation.* Final consent decree, Sun Corporation is the sole owner of the patent and is valid. Counts I and II of the complaint are dismissed with prejudice. Defendant's first and second counterclaims are dismissed with prejudice, Feb. 16, 1971.

**2,703,579,** Merancy and Weisz, AUTO CAR WASHING MACHINE, **filed** Aug. 17, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c2024, *California Car Wash Systems, Inc.* v. *Motor Valet Industries, Inc.* Order motion for voluntary dismissal granted, Jan. 18, 1971. **Same, filed** Sept. 2, 1970, D.C., W.D.N.Y. (Buffalo), Doc. C–1970–390, *California Car Wash Systems, Inc.* v. *Miton Car Wash Equipment, Inc.* Voluntary dismissal, Jan. 20, 1971.

**2,750,660,** J. F. Newcomb, MECHANISM FOR AND METHOD OF CLINCHING NUTS; **2,799,188,** same, MEANS FOR CLINCHING NUTS ON METAL PANELS, **filed** Dec. 24, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c3232, *Multifastener Corporation* v. *MacLean-Fogg Lock Nut Company.*

**2,753,694,** Trow and Nelson, ICE DISINTEGRATING AND CHIP DELIVERING SPIRAL ICE CHIP PRODUCING MACHINE, **filed** Nov. 16, 1967, U.S. Ct. of App., 6th Cir., E.D. Mich (Detroit), Doc. 19825, *Uniflow Manufacturing Co., and Jefferson Ice Company* v. *King-Seeley Thermos Co.* The decision of the District Court is affirmed in regard to its findings of the validity of the patent and infringement, June 18, 1970.

**2,754,228.** (See 3,000,576.)

**2,799,188.** (See 2,750,660.)

**2,804,401,** B. A. Cousino, MAGNETIC SOUND TAPE, **filed** Feb. 3, 1971, D.C., N.D. Ill. (Chicago), Doc. No. 71c315, *Farady, Inc., etc.* v. *Minnesota Mining & Mfg. Co., etc.*

**2,812,898,** E. H. Buell, REVERSE ACTION ROTORS FOR USE IN A JET PROPULSION SYSTEM; **2,871,982,** same, LUBRICATING, COOLING AND OIL SEALING SYSTEM FOR COUNTER ROTATING ENGINES, **filed** Dec. 17, 1970, D.C., N.D.N.Y. (Utica), Doc. 70–CV–447, *Gino Pietropaoli, executor of Ernest H. Buell, deceased* v. *United Aircraft Corporation.*

**2,841,566.** (See 2,742,378.)

**2,843,935,** H. J. Germer, INSTRUMENT FOR MEASURING, INTERPOLATING, PLOTTING AND THE LIKE, **filed** Jan. 28, 1971, D.C. Mass. (Boston), Doc. 70–258–J, *The Gerber Scientific Instrument Co.* v. *Charles J. Colligan and Data Scales, Inc.*

**2,853,736,** A. Gussoni, MACHINE FOR THE MANUFACTURE OF BOTTLES FROM PLASTIC MATERIAL; **3,011,216,** Same, METHOD FOR PRODUCING HOLLOW BLOWN ARTICLES FROM THERMOPLASTIC MATERIALS, **filed** Jan. 6, 1971, D.C.N.J. (Camden), Doc. C–27–71, *Samuel Dubiner* v. *Wheaton Industries, Inc.* **Same, filed** Jan. 29, 1971, D.C.N.J. (Camden), Doc. C–125–71, *Samuel Dubiner* v. *Jomar Industries, Inc.*

**2,871,982.** (See 2,812,898.)

**3,000,576,** Levey and Harvey, SPRAY GUN; **3,018,968,** G. S. Levey, CLOSED SYSTEM RECIRCULATING ASSEMBLY; **2,754,228,** J. A. Bede, METHOD OF SPRAY PAINTING, **filed** Apr. 8, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c749, *Spee-Flo Manufacturing Corp.* v. *Nordson Corporation and Frank G. Hough Co.* Final judgment by consent, Dec. 18, 1970.

**3,011,216.** (See 2,853,736.)

**3,016,116,** C. L. Clevenger, RETAINING MEANS FOR CONSTRUCTION PANELS; **3,083,794,** W. C. Stovall, JOINED SHEET METAL STRUCTURES; **3,292,318,** C. L. Clevenger, RETAINING CLIP FOR CONSTRUCTION PANELS WITH TEAR STRIPS, **filed** Jan. 20, 1971, D.C., M.D.N.C. (Greensboro), Doc. C–15–WS–71, *Keene Corporation* v. *Costal Expanded Metal Company, Inc., et al.*

**3,018,968.** (See 3,000,576.)

**3,046,110,** M. P. Schmidt, PROCESS OF MAKING PRINTING PLATES AND LIGHT SENSITIVE MATERIAL SUITABLE FOR USE THEREIN, **filed** Jan. 25, 1971, D.C. Del. (Wilmington), Doc. 4049 (transferred from District of Maryland, No. 19764–C), *Azoplate Corporation* v. *James E. Harper.*

**3,055,705,** K. H. Wilson, FOLDING TABLE AND SEAT STRUCTURE, **filed** Jan. 22, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c190, *Kermit H. Wilson and Sico Inc.* v. *Midwest Folding Products Mfg. Co., Midwest Folding Products Sales Corp.* **Same, filed** Jan. 25, 1971, D.C., N.D. Ind. (South Bend), Doc. 71–S–8, *Kermit H. Wilson and Sico Incorporated* v. *The Peabody Seating Co., Inc. and American Standard, Inc.*

**3,083,794.** (See 3,016,116.)

**3,089,310,** E. Torti, TRENCH SHORING MACHINE, **filed** Oct. 30, 1970, U.S. Ct. of App., 1st Cir., Boston, Mass., Doc. 7750, *Shields-Jetco, Inc., et al., Tulsa- Jetco, Inc.* v. *Emanuel Torti.* Judgment of the District Court based upon a finding of non-infringement is affirmed, Jan. 19, 1971.

**3,123,978,** F. L. Pruyn, H-BEAM PILE CUTTER AND COMBINATION WITH H-BEAM PILE, **filed** July 13, 1964, D.C., S.D.N.Y. Doc. 64–C–2161, *Associated Pipe & Fitting Company, Inc. et ano.* v. *Belgian Line, Inc. et ano.* Filed order, action discontinued, Jan. 25, 1971.

**3,204,512,** R. Mazzeo, CLARINET, **filed** Jan. 20, 1971, D.C., E.D. Mich. (Detroit), Doc. 35956, *Huck Mfg. Co.* v. *Textron Inc.*

**3,286,606.** (See 3,304,101.)

**3,288,041.** (See 3,304,101.)

**3,292,318.** (See 3,016,116.)

**3,304,101,** J. D. Layton, COUPLING MECHANISM FOR TRAILERS; **3,288,041,** same, MULTIPLE-USE PAVER; **3,286,606,** same, HEATED SCREED ASSEMBLY, **filed** Dec. 4, 1970, D.C., E.D. Mo. (St. Louis), Doc. 70C607(1), *Layton Mfg. Co.* v. *Ford Lane Equipment Co., Inc. and Kenneth Greening.*

**3,363,224.** (See Re. 26,837.)

**3,552,252,** Maxey, Montague, Leyde and Bryan, VENEER DEFECT DETECTOR AND CLIPPER CONTROL, **filed** Jan. 21, 1971, D.C., S.D. Ohio (Cincinnati), Doc. 7834, *Tech Serv, Inc.* v. *Black-Clawson Company, Inc.*

**Re. 26,837,** W. R. Evans, ELECTRICAL CONNECTING SYSTEM AND PARTS; **3,363,224,** Gluntz, Lightner and Shue, ELECTRICAL CONNECTOR, **filed** Jan. 15, 1971, D.C., C.D. Calif (Los Angeles), Doc. 71–122–AAH, *AMP Incorporated* v. *S.A.E. Advanced Packaging, Inc.*

**D. 219,118,** K. R. Baker, BOAT, **filed** Nov. 20, 1970, D.C. N.D. Calif. (San Francisco), Doc. C70–2504 RFP, *Sidewinder Marine, Inc.* v. *Bruce Nescher and Sleekcraft Boats, Inc.* Judgment in favor of plaintiff, permanent injunction against the defendants, Jan. 4, 1971.

## Certificates of Correction for the Week of June 22, 1971

| | | | |
|---|---|---|---|
| 3,350,421 | 3,550,218 | 3,560,603 | 3,567,714 |
| 3,463,725 | 3,551,658 | 3,560,876 | 3,567,759 |
| 3,485,022 | 3,551,782 | 3,561,434 | 3,567,900 |
| 3,503,962 | 3,551,913 | 3,561,660 | 3,567,958 |
| 3,518,647 | 3,552,247 | 3,561,835 | 3,568,054 |
| 3,522,301 | 3,553,373 | 3,562,076 | 3,568,069 |
| 3,523,462 | 3,553,554 | 3,562,280 | 3,568,100 |
| 3,526,887 | 3,554,812 | 3,562,380 | 3,568,158 |
| 3,527,848 | 3,554,824 | 3,562,384 | 3,568,603 |
| 3,530,135 | 3,554,945 | 3,562,736 | 3,568,704 |
| 3,531,547 | 3,555,112 | 3,563,550 | 3,568,772 |
| 3,532,216 | 3,555,364 | 3,563,704 | 3,568,972 |
| 3,532,737 | 3,555,379 | 3,563,730 | 3,569,680 |
| 3,533,922 | 3,556,301 | 3,563,955 | 3,569,819 |
| 3,533,936 | 3,556,943 | 3,564,003 | 3,569,908 |
| 3,534,683 | 3,556,968 | 3,564,312 | 3,570,234 |
| 3,535,141 | 3,556,988 | 3,564,350 | 3,570,333 |
| 3,535,388 | 3,556,995 | 3,564,400 | 3,570,337 |
| 3,536,666 | 3,557,073 | 3,564,551 | 3,570,433 |
| 3,538,222 | 3,557,114 | 3,564,963 | 3,571,491 |
| 3,539,376 | 3,557,239 | 3,565,362 | 3,571,622 |
| 3,539,560 | 3,557,354 | 3,565,601 | 3,571,666 |
| 3,543,703 | 3,557,415 | 3,565,802 | 3,571,747 |
| 3,544,034 | 3,557,683 | 3,565,829 | 3,571,765 |
| 3,547,175 | 3,557,707 | 3,565,897 | 3,573,111 |
| 3,547,184 | 3,557,998 | 3,566,216 | 3,573,117 |
| 3,547,309 | 3,558,740 | 3,566,259 | 3,573,281 |
| 3,547,681 | 3,559,044 | 3,566,597 | 3,573,287 |
| 3,547,976 | 3,559,596 | 3,567,431 | |
| 3,548,215 | 3,560,345 | 3,567,451 | |
| 3,549,500 | 3,560,533 | 3,567,632 | |

## Examination

Pursuant to the provisions of Rule 341(c), an examination for persons seeking registration before the United States Patent Office as patent attorneys or agents will be held on Tuesday, September 7, 1971.

With the exception of those former patent examiners for whom the examination is waived, all persons recognized for practice before the Patent Office in patent cases must, pursuant to the noted rule, pass the examination. Those passing the examination do not thereby qualify for recognition for practice before the Patent Office in trademark cases. Recognition for practice in trademark cases is governed by Rule 2.12 of the Trademark Rules of Practice, which does not require the passing of an examination.

This examination will be given under the supervision of the Civil Service Commission, and may be taken in any of the cities in which the Civil Service Commission regularly conducts examinations. Applications to take the examination must be filed in the Patent Office together with a $35 fee not later than August 2, 1971.

Application blanks may be obtained from the Clerk of the Patent Office Committee on Enrollment, Bldg. 3, 11th Fl., Rm. C16, Crystal Plaza, Arlington, Va., or by mail addressed to the Commissioner of Patents, Washington, D.C. 20231, and directed to the attention of the Clerk of the Committee on Enrollment.

ROBERT GOTTSCHALK,
*Chairman, Committee on Enrollment.*

# PATENT EXAMINING CORPS

**R. A. WAHL, Assistant Commissioner**
**F. H. BRONAUGH, Deputy Assistant Commissioner**

## CONDITION OF PATENT APPLICATIONS AS OF JUNE 1, 1971

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 1-02-70 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 1-01-70 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes. | 2-17-70 |
| COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography. | 3-30-70 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 1-05-70 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous. | 9-21-70 |
| SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material. | 1-19-70 |
| INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 5-01-70 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 1-27-70 |
| PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments. | 2-17-70 |
| DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts. | 6-17-70 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages. | 4-03-70 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks. | 2-02-70 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination. | 2-24-70 |
| HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing. | 6-25-70 |
| CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling. | 2-02-70 |

**Expiration of patents:** The patents within the range of numbers indicated below **expire during** June 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

**Patents**..... **Numbers 2,679,645 to 2,682,657, inclusive**
**Plant Patents**..... **Numbers 1,282 to 1,287, inclusive**

# DEFENSIVE PUBLICATIONS

## JUNE 22, 1971

**Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.**

**Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.**

### T887,017

### RADIOGRAPHY METHOD

**George W. Luckey, Bernard Roth, and Paul W. Wagner, all of Kodak Park Works, Rochester, N.Y. 14650**

**Filed Mar. 16, 1970, Ser. No. 20,119**

**Int. Cl. G03b *17/26, 41/16***
**U.S. Cl. 250—68**

**No Drawing. 10 Pages Specification**

In radiography the speed of a lead sulfate screen-film system and of a lead-activated barium sulfate screen-film system with a high concentration of lead in the phosphor is increased by reducing the temperature at which the system is exposed to high energy radiation. Acceptable radiographs can be made with low exposures to radiation at temperatures below −50° C. by cooling the screen-film combination with Dry Ice or other means. The speed of a screen which comprises lead sulfate phosphor in a polycarbonate binder is eight times greater at −70° C. than at room temperature.

### T887,018

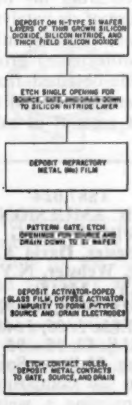
### FABRICATION OF INTEGRATED CIRCUIT GATE FIELD EFFECT TRANSISTORS

**Gianpiero S. Rodari, Milan, Italy, assignor to General Electric Company**

**Filed Mar. 17, 1970, Ser. No. 20,301**

**Int. Cl. H01l *7/44***
**U.S. Cl. 148—187**

**2 Sheets Drawing. 16 Pages Specification**


DEPOSIT ON N-TYPE SI WAFER LAYER OF THIN GROWN SILICON DIOXIDE, SILICON NITRIDE, AND THICK FIELD SILICON DIOXIDE
ETCH SINGLE OPENING FOR SOURCE, GATE, AND DRAIN DOWN TO SILICON NITRIDE LAYER
DEPOSIT REFRACTORY METAL (Mo) FILM
PATTERN GATE, ETCH OPENINGS FOR SOURCE AND DRAIN DOWN TO SI WAFER
DEPOSIT ACTIVATOR-DOPED GLASS FILM, DIFFUSE ACTIVATOR IMPURITY TO FORM P-TYPE SOURCE AND DRAIN ELECTRODES
ETCH CONTACT HOLES, DEPOSIT METAL CONTACTS TO GATE, SOURCE, AND DRAIN

A low cost optimum process for fabricating monolithic integrated circuit insulated gate field effect transistors which utilize a refractory metal diffusion mask. As the first step, there is deposited on the semiconductor substrate a thin layer of gate insulator, preferably a laminate of grown silicon dioxide and silicon nitride, and a thick pyrolytically deposited field oxide. After forming a single opening down to the silicon nitride for source, gate, and drain regions, and depositing a thin film of molybdenum, subsequent processing is completed without removing the initially deposited gate insulator. This includes forming drain and source openings through the refractory metal film and gate insulator layers, depositing an activator impurity-doped glass coating over the entire processed substrate, and diffusing the activator impurity into the substrate using the patterned molybdenum film as a diffusion mask. Contact holes are then made through the glass coating, and contact metallizations are applied.

### T887,019

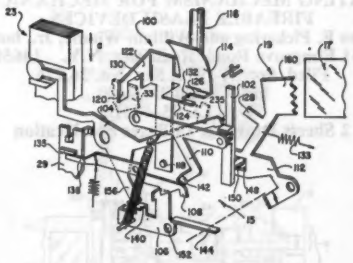
### PHOTOGRAPHIC APPARATUS FOR USE WITH MECHANICALLY FIREABLE FLASH STRUCTURES

**Paul J. Ernisse and Richard S. Tompkins, both of 901 Elmgrove Road, Rochester, N.Y. 14650**

**Filed Mar. 30, 1970, Ser. No. 23,535**

**Int. Cl. G03b *19/00***
**U.S. Cl. 95—11L**

**3 Sheets Drawing. 17 Pages Specification**



Photographic apparatus, such as a camera, for sensing the condition of and for firing a percussive flash device. The flash device includes a lamp and a striker (**7**) lodged in an energized position from which it is releasable to fire the lamp. The apparatus includes an actuating member (**102**) movable from a first position retracted from the flash device, to a second position for sensing and engaging an energized striker in the device, and to a third position for releasing the striker to fire the device. The member is moved from the first position to the second position in response to initial depression of the camera body release. Thereafter, movement from the second position to the third position and back to the first position is effected by translation of a driver from an energized condition to a released condition.

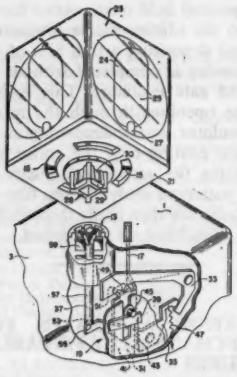
**T887,020**

## APPARATUS AND SAFETY MECHANISM FOR USE WITH MECHANICALLY FIREABLE FLASH DEVICES

**Chester W. Michatek and Harold L. Malone, both of 901 Elmgrove Road, Rochester, N.Y. 14650**

**Filed Mar. 30, 1970, Ser. No. 23,643**
**Int. Cl. G03b** *15/04*
**U.S. Cl. 95—11.5R**
**2 Sheets Drawing. 13 Pages Specification**

Photographic apparatus and a safety mechanism for preventing the accidental firing of a mechanically fireable flash device when the device is first positioned on the apparatus. The flash device includes a striker lodged in an energized position from which it is releasable by the apparatus to fire the device. The apparatus has a sensing and/or actuating member movable into non-releasing engagement with the striker in response to positioning of the device on the apparatus, and further includes mechanisms for preventing the accidental release of the striker during such movement of the member into engagement with the striker.



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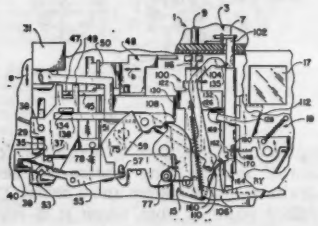
**T887,021**

## ACTUATING MECHANISM FOR MECHANICALLY FIREABLE FLASH DEVICES

**Charles E. Pickering and William Windle, Jr., both of 901 Elmgrove Road, Rochester, N.Y. 14650**

**Filed Apr. 7, 1970, Ser. No. 26,276**
**Int. Cl. G03b** *19/00*
**U.S. Cl. 95—11L**
**2 Sheets Drawing. 18 Pages Specification**



An improved actuating mechanism in apparatus, such as a photographic camera, for sensing the condition of and for firing a percussive flash device. The flash device includes a lamp and a striker (7) lodged in an energized position from which it is releasable to fire the lamp. The apparatus includes an actuating member (102) movable in a first direction to fire the device, and in a second direction to space the member from the device. Energy for moving the actuating member in the first direction is translated from a driver (106) to the actuating member by a coupling lever (110) that first moves into engagement with the actuating member to drive the member in the first direction, and then moves out of engagement with the actuating member to permit return of the member to the second direction.

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**T887,022**

## POST STABILIZATION BATH PROCESSING

**Norman W. Kalenda, Kodak Park Works, Rochester, N.Y. 14650**

**Filed Apr. 27, 1970, Ser. No. 32,440**
**Int. Cl. G03c** *5/26, 5/28*
**U.S. Cl. 96—61**
**No Drawing. 19 Pages Specification**

Post-stabilization baths comprising from about 30 to about 80 percent by weight of a polyalkylene glycol, especially polyethylene glycol, having a molecular weight of at least about 1000, e.g. an aqueous methanol or ethanol solution, are utilized in the processing of exposed incorporated developer photographic silver halide elements to provide dry, stable prints and negatives with improved keeping properties and substantially free of antihalation pelloid dye stain. These baths are useful in stabilization processing. The post-stabilization bath can be, for example, an aqueous methanol solution of polyethylene glycol containing about 30 to about 80 percent by weight polyethylene glycol.

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**T887,023**

## PREPARATION OF BIS(CHLOROFORMATES) OF 2,2,4,4-TETRAALKYL-1,3-CYCLOBUTANEDIOLS

**Raymond D. Clark, P.O. Box 511, Kingsport, Tenn. 37662**

**Filed May 13, 1970, Ser. No. 36,998**
**Int. Cl. C07c** *69/64*
**U.S. Cl. 260—463**
**No Drawing. 11 Pages Specification**

Process for the preparation of bis(chloroformates) of cyclic secondary glycols such as those of the 2,2,4,4-tetraalkyl-1,3-cyclobutanediol series by reaction between the glycol and phosgene employing a Lewis base such as pyridine as the catalyst. These compounds are useful as chemical intermediates for the preparation of various polymeric products such as polyurethanes, polycarbonates, synthetic lubricants and plasticizers with high hydrolytic stability. In this reaction an equivalent amount of hydrogen chloride gas is evolved. The process is distinguished from known processes of preparing bis(chloroformates) by the fact that only a catalytic amount of a Lewis base is employed as distinguished from the use of an equivalent amount of a base or use of no catalyst. By catalyzing the reaction in this manner a substantial improvement in yields of the bis(chloroformate) product is obtained, as compared to the yields obtained from known processes where no catalyst is employed, and the necessity for removing an equivalent amount of salt from the product is avoided.

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**T887,024**

## PHOTOGRAPHIC EMULSIONS FOR RAPID PROCESSING

**Grant M. Haist, Rochester, David A. Pupo, Churchville, and James R. King, Webster, N.Y. (all of 166A Lake Ave., Rochester, N.Y. 14615)**

**Filed May 28, 1970, Ser. No. 41,574**
**Int. Cl. E03c** *1/06, 1/48, 5/30*
**U.S. Cl. 96—95**
**No Drawing. 22 Pages Specification**

Photographic silver salt compositions, such as silver halide emulsions, containing a weighted hydroquinone developing agent, such as t-butyl hydroquinone or cyclohexylhydroquinone, and an alkaline-activatable stabilizer precursor, such as a thiuronium salt, have good keeping qualities and can be rapidly processed by alkaline activation.

T887,025

## AQUEOUS COATING COMPOSITIONS AND WATER-INSOLUBLE COATINGS PRODUCED THEREFROM

Jack W. Lowe, 520 Rambling Road 37663, and James M. Hawkins, 2104 E. Sevien 37664, both of Kingsport, Tenn., and Larry G. Curtis, 3606 Cimarron Drive, Johnson City, Tenn. 37601

Filed May 28, 1970, Ser. No. 41,579
Int. Cl. C08g *37/34*
U.S. Cl. 260—29.4OA
No Drawing. 16 Pages Specification

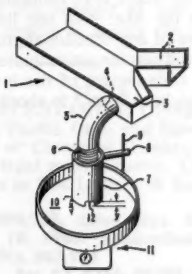
Coating compositions containing (A) a cross-linkable, water-dispersible, oil-free alkyd resin and (B) a water-dispersible amino resin such as urea-formaldehyde and melamine-formaldehyde, both of said resin components being dispersed in an aqueous medium to form a dispersion which can be applied to produce water insoluble, tough, flexible coatings on a variety of surfaces such as those of metal, wood, fabric and the like. The water-dispersible alkyd resin is prepared by reacting a polyol with a dibasic acid, a portion of which acid is dimethylsodiumsulfoisophthalic acid. The resulting resin will have hydroxyl groups along the polymer chain which contribute cross-linkability with an amino resin and is further characterized by having ionic groups derived from the dimethylsodiumsulfoisophthalic acid component also distributed along the polymer chain. The two resin components are dispersed in an aqueous medium to form a sprayable composition which, when applied to surfaces to be protected and thereafter heat-treated, produce tough, flexible, water-insoluble coatings by cross-linking of the two components.

T887,026

## FLOW CONTROLLER

John R. Stevens, Montague, Mich., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 26, 1970, Ser. No. 50,101
Int. Cl. B65g *47/00*
U.S. Cl. 198—45
1 Sheet Drawing. 8 Pages Specification



A feed controller for providing a uniform flow of articles which consists essentially of (a) a first vibratory conveyor having an aperture for the discharge of particulate matter, (b) a second vibratory conveyor, preferably a circular track two plane vibratory feeder, (c) a vertical flexible open flow tube connecting to said first conveyor through said aperture and leading to the surface of said second conveyor, and (d) an independently supported guide tube positioned around the flow tube so that the flow tube is free to move within said guide tube, said guide tube extending to a point below the discharge end of the flow tube and immediately above the surface of the second conveyor, the height of the guide tube above the surface of the second conveyor being determined by the desired depth of articles to be fed to the second conveyor and being at a minimum about the minimum dimension of the articles to be fed and at a maximum about one and one-half times the minimum dimension of the articles, said guide tube having a feed aperture positioned below the discharge end of the flow tube and immediately above the surface of the second vibratory conveyor, said aperture being wider than the greatest dimension of the articles to be fed and having a height of about one to two times the minimum dimension of the articles.

T887,027

## IMAGE TRANSFER PROCESS

Jonas J. Chechak, Brockport, N.Y.
(Kodak Park Works, Rochester, N.Y. 14650)

Filed July 24, 1970, Ser. No. 58,191
Int. Cl. G03g *13/14*
U.S. Cl. 96—1.4
No Drawing. 13 Pages Specification

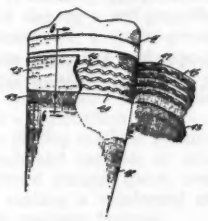
A method of forming transferred liquid developed electrostatic images includes the steps of forming an electrostatic charge pattern on a charge-bearing member, applying to said pattern a liquid developer containing a mordantable, water-soluble acid dye salt to form a developed image, substantially drying said image and contacting the visible dry image with a moist receiver sheet having coated thereon a layer containing a mordant having a strong affinity for said dye so that the dye is thereby insolubilized before wandering of the dye can occur.

T887,028

## MULTIPIECE GARMENT

Oliver N. Seelig, 26 Hawthorne Road, Wyomissing Hills, Pa. 19069

Continuation of application Ser. No. 808,053, Feb. 18, 1969, which is a continuation-in-part of application Ser. No. 647,510, June 20, 1967. This application Aug. 7, 1970, Ser. No. 62,168
Int. Cl. A41b *11/00*
U.S. Cl. 2—240
2 Sheets Drawing. 18 Pages Specification



Multipiece garments in which the separate pieces of the garment are retained in engagement with one another by means of complementary fastening elements secured respectively to the inside and outside of the body openings of the pieces at their juncture so that when the pieces are overlapped on the body, the complementary fastening elements interengage to inhibit inadvertent separation of the two pieces of the garment. In the preferred forms, the elements comprise elastomeric projections disposed in straight-line runs, zigzag runs (FIG. 5), and dots cooperating with lattices. In particular (see FIG. 5), a separable panty hose formed of a girdle portion **41** and stocking portions **42** is provided with complementary leg-encircling bands **45** at the top of the stockings and on the leg of the girdle having projections **46** and **47** which interengage to unite the stockings and the girdle into a substantially unitary garment in the nature of a panty tight.

**T887,029**

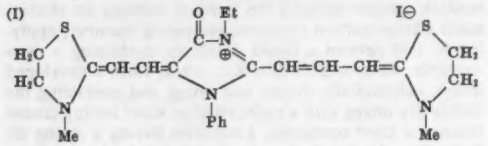
## PREPARATION OF SILVER HALIDE MATERIALS

**Cynthia Geer Ulbing, Fairport, N.Y. (% Eastman Kodak Co., Kodak Park Division, Rochester, N.Y. 14650)**

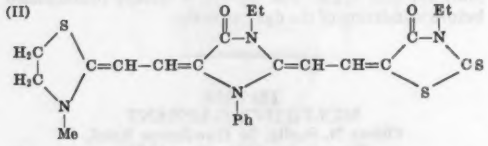
**Filed Aug. 31, 1970, Ser. No. 68,524**
**Int. Cl. G03c *1/08, 1/12***
**U.S. Cl. 96—127**
**No Drawing. 13 Pages Specification**

Low concentrations of certain quaternated trinuclear complex cyanine I, trinuclear complex merocyanine II and quaternated tetranuclear complex cyanine dyes III prevent reduction sensitization when present during silver halide grain formation, especially when precipitating silver halide grains under conditions which normally result in reduction sensitization. In certain embodiments, the effect is obtained with concentrations of the dyes well below the effective spectral-sensitizing concentrations, e.g., of the order of 0.1 to 25 mg. of dye per mole of silver halide formed in the precipitation. Examples of useful dyes include:

(I)

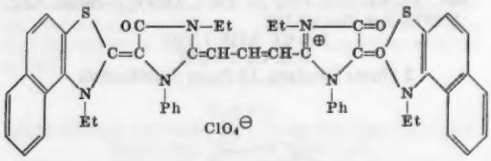


(II)



and

(III)



In one embodiment of this invention, silver halide grains can be prepared, in the presence of said dyes at a pH number of above 4 and preferably above 6 and/or a pAg of less than 9.0, which are substantially free of reduction sensitization, especially when making cubic-regular grains.

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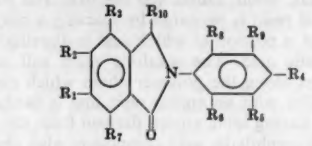
**T887,030**

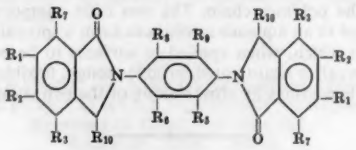
## OPTICAL BRIGHTENING COMPOSITIONS

**John Albert Ford, Jr., and John Frederick Stenberg, both % Eastman Kodak Co., Kodak Park Division, Rochester, N.Y. 14650**

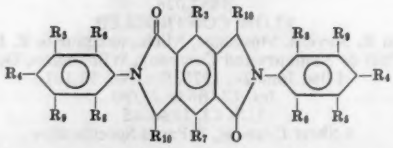
**Filed Sept. 11, 1970, Ser. No. 71,409**
**Int. Cl. G03c *1/92***
**U.S. Cl. 96—82**
**No Drawing. 18 Pages Specification**

This invention relates to an optically brightened material comprising an organic material to be brightened and at least one brightening agent which is a N-arylphthalimidine. Illustrative phthalimidines employed can be represented by the structural formulas:





and



wherein each of $R_1$ through $R_{10}$ can be: hydrogen; alkyl, including substituted alkyl; aryl, including substituted aryl; halo; cyano; and the like; with the limitation that said substituents be free of any functional groups which evolve gas in the Zerwitinoff test for active hydrogen.

In a preferred embodiment of the invention, the alkyl and aryl groups can have from 1 to about 12 carbon atoms.

# REISSUES

## JUNE 22, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

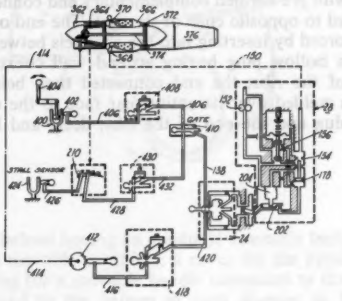
### 27,142
### FLUIDIC ENGINE FUEL CONTROL SYSTEM

**Lael B. Taplin, Livonia, Walter F. Datwyler, Jr., Royal Oak, Thomas E. Thompson, Rochester, and Joseph P. Madurski, Royal Oak, Mich., assignors to The Bendix Corporation**

**Original No. 3,392,739, dated July 16, 1968, Ser. No. 290,527, June 25, 1963. Application for reissue June 2, 1969, Ser. No. 835,293**

**Int. Cl. F02c** *9/08*

**U.S. Cl. 60—39.23** **22 Claims**



*A fuel control system for metering fuel flow to the combustion chambers of an engine is herein disclosed. The system incorporates fluidic elements to calculate operator demand and engine demand for fuel and a proportioning element then controls the positioning of a valve to provide the amount of fuel calculated to be required by the engine to satisfy the operator demand.*

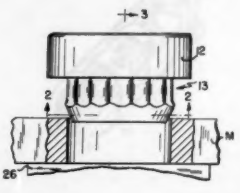
### 27,143
### SELF-STAKING INSERT

**Arthur R. Breed, Euclid, Ohio, and Edward A. Anderson, deceased, late of Cleveland Heights, Ohio, by Phyllis T. Anderson, legal representative, Cleveland Heights, Ohio, assignors to The Lamson & Sessions Co., Cleveland, Ohio**

**Original No. 3,399,705, dated Sept. 3, 1968, Ser. No. 526,604, Feb. 10, 1966. Application for reissue July 30, 1969, Ser. No. 862,984**

**Int. Cl. F16b** *39/00*

**U.S. Cl. 151—41.73** **14 Claims**



A self-staking insert having a polygonal shank wherein the sides are planar and adjacent sides of the polygon are joined by arcuately curved surfaces so as to provide a continuous peripheral surface which approaches circularity, a bulge portion at the leading end of the shank which is wider than the receiving hole if prepunched and which tapers to a circular end face.

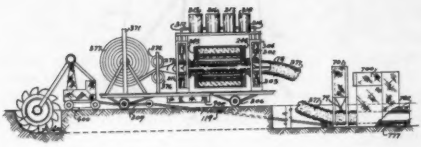
### 27,144
### MANUFACTURE OF REINFORCED COMPOSITE CONCRETE PIPE-LINE CONSTRUCTIONS

**David Rubenstein, San Diego, Calif., assignor to Chemstress Industries, Inc.**

**Original No. 3,380,259, dated Apr. 30, 1968, Ser. No. 522,336, Oct. 24, 1965, which is a continuation-in-part of Ser. No. 392,075, Aug. 19, 1964, and Ser. No. 391,987, Aug. 25, 1964. Application for reissue Apr. 28, 1969, Ser. No. 824,011**

**Int. Cl. F16l** *1/00*; **B31c** *11/04*

**U.S. Cl. 61—72.2** **34 Claims**



This patent application relates to methods and apparatus for the manufacture of polymeric-resin composition - fiber reinforced - cast - in- place- porous - structural - material - concrete - pipe - lines. Pipe - liners are provided on-site by make-up and processing apparatus and placed in a ditch dug by a self-propelled ditcher which hauls said apparatus on a trailer-processing rig which provides said pipe-liner. The said pipe-liner acts first as a forming means for casting a concrete cover component of the pipe-line and remains in place as a polymerized-polymeric - resin - composition - fiber - reinforced - pipe-liner. A concrete placing machine is hauled over the pipe-liner in the trench and concrete or other porous structural material placed around, about, over and under the pipe-liner, thus making a reinforced concrete pipe-line having corrosion resistant features.

### 27,145
### HYDROGENATED BLOCK COPOLYMERS OF BUTADIENE AND A MONOVINYL ARYL HYDROCARBON

**Robert C. Jones, San Francisco, Calif., assignor to Shell Oil Company, New York, N.Y.**

**Original No. 3,431,323, dated Mar. 4, 1969, Ser. No. 338,795, Jan. 20, 1964. Application for reissue May 20, 1969, Ser. No. 848,755**

**Int. Cl. C08f** *15/04*

**U.S. Cl. 260—880** **10 Claims**

Hydrogenated block copolymers having a superior combination of physical properties are prepared by block polymerizing a vinyl arene with butadiene in the presence of a polar compound to cause a limited amount of branching in the polybutadiene block and thereafter hydrogenating the polymer.

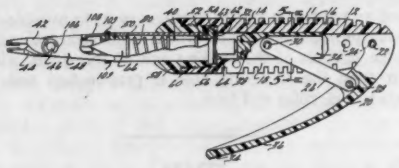
## 27,146
## CAM ACTUATED PIVOTED JAW TOOL

Walter J. Rozmus, Hubbardsville, N.Y., assignor to Utica Tool Company, Inc., Orangeburg, S.C.

Original No. 3,372,480, dated Mar. 12, 1968, Ser. No. 557,686, June 15, 1966. Application for reissue Dec. 22, 1969, Ser. No. 870,284

Int. Cl. B26b *17/02*

U.S. Cl. 30—193 15 Claims



A pivoting jaw tool which is especially suited for use as a wire nipper. The jaws are formed separately from the remaining portion of the tool and are fitted together in such a manner as to insure their proper alignment. Accordingly, the jaws may be installed on the tool by a removable pivot pin without having to carefully fit them to the tool. The jaws are wedge-actuated and the actuating wedge, together with the jaws and the jaw holder, form a separable subassembly which can be readily interchanged on the tool. The wedge is actuated through operation of a handle pivoted to the tool body.

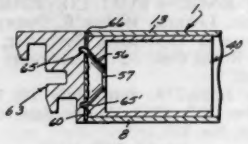
## 27,147
## LANDING MAT

Leo Myer Harvey, Los Angeles, Calif., assignor to Harvey Aluminum (Incorporated), Torrance, Calif.

Original No. 3,450,010, dated June 17, 1969, Ser. No. 711,681, Mar. 8, 1968. Application for reissue Nov. 4, 1969, Ser. No. 870,653

Int. Cl. E01c *5/00*

U.S. Cl. 94—13 21 Claims



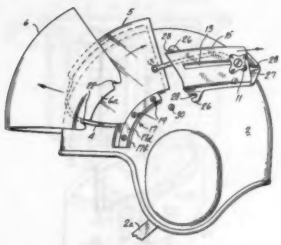
This invention relates to extruded metal landing mats having deck and base plates spaced by means of parallel ribs with pre-formed complementary end connectors being welded to opposite ends of the mat. The end of the mat is reinforced by inserting into the channels between adjacent ribs a hollow plug having an end wall coextensive with end of the ribs; the end connected then being electron beam welded over its entire rear face to the end wall of the plug and the end of the ribs, deck, and base plates.

# PATENTS

GRANTED JUNE 22, 1971

## GENERAL AND MECHANICAL

**3,585,638**
**SAFETY HELMET WITH RELEASABLE EYESHIELD**
**Jackson Anthony Aileo, Carbondale, Pa., assignor to Gentex Corporation, Carbondale, Pa.**
**Filed Jan. 2, 1970, Ser. No. 357**
**Int. Cl. A42b** *3/00*
**U.S. Cl. 2—6** **16 Claims**



A safety helmet having an eyeshield assembly including at least one movable eyeshield, a cover for the eyeshield, and a housing for a movable handle connected to the eyeshield, secured to the helmet in such manner as to be detachable therefrom when subjected to lifting forces exerted by unusual conditions of air flow or pneumatic pressure that might otherwise tend to twist the wearer's head or displace the helmet. In one embodiment, the cover and housing have open-ended slots and are secured to the helmet by screws disposed in the slots, which are so oriented that the aforementioned lifting forces can slide the cover and housing out of engagement with the screws, releasing the eyeshield assembly from the helmet.

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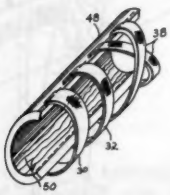
**3,585,639**
**PROTECTIVE ATHLETIC PAD**
**James H. Enicks, Greenville, Ohio, assignor to Johnson & Johnson**
**Continuation-in-part of application Ser. No. 422,788, Dec. 31, 1964, now Patent No. 3,446,788. This application Feb. 24, 1969, Ser. No. 801,490**
**Int. Cl. A41d** *13/06*
**U.S. Cl. 2—22** **4 Claims**



An athletic pad and a method of manufacturing the pad, of which the body of the pad is a foamed plastisol material and at least a portion of the pad surface is skin-like and fluid impervious. Attaching straps, or bands, may be secured to the pad for connecting it to the body and reinforcing elements may be mounted in the pad for the connection of the straps or bands thereto.

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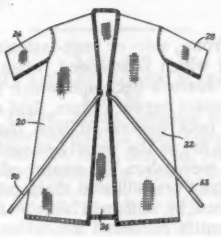
**3,585,640**
**GARMENT**
**Nathan L. Belkin, St. Louis, Mo., assignor to Angelica Corporation, St. Louis, Mo.**
**Filed May 19, 1969, Ser. No. 825,544**
**Int. Cl. A41d** *1/22*
**U.S. Cl. 2—74** **3 Claims**



A wrap-around garment is made with ties and with tie-receiving openings which permit the left-hand front portion of that garment to be wrapped over the right-hand front portion of that garment or permit the right-hand front portion of that garment to be wrapped over the left-hand front portion of that garment.

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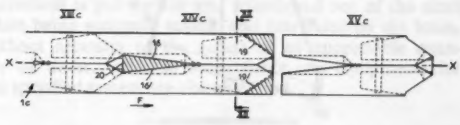
**3,585,641**
**METHOD OF MANUFACTURING OVERALLS OR LIKE CLOTHES AND ARTICLES THUS OBTAINED**
**Claude Raymond Pierron, 7 Rue Albert 1er, Epinal, Vosges, France**
**Filed Dec. 4, 1969, Ser. No. 882,037**
**Claims priority, application France, Dec. 30, 1968, 182,054**
**Int. Cl. A41d** *13/02*
**U.S. Cl. 2—79** **17 Claims**



A method of making overalls, on a moving-band, flow-production basis from yielding foldable sheet material comprising prefabricating crutch easing gores and pairs of right and left sleeves, properly positioning them on a continuous web, folding back towards each other the longitudinal side portions of said web in overlapping relationship at the middle of said web to provide the body panels

and legs; assembling locally said web to the sleeves along the armhole peripheries and to said gores along slant lines; and severing the individual overalls alongside said slant lines and armhole peripheries and along the leg bottoms and collar ends.

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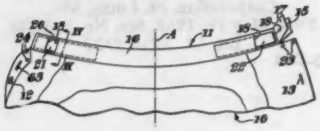
3,585,642
**CLERICAL AND OTHER GARMENTS**
Joanna Christina Gleeson, 1 Down St. Mews, London W.1, England
Filed Apr. 21, 1969, Ser. No. 817,731
Claims priority, application Great Britain, May 8, 1968, 21,752/68
Int. Cl. A41b *1/14*
U.S. Cl. 2—127 13 Claims



A washable front-, side- or back-fastening garment having a neckband which is intended, when worn, to stand up around the wearer's neck and which has spaced ends which define a space between them. Said neckband stands up around the neck because at least those parts of the neckband which are in the vicinity of said neckband ends and which are seen when the wearer of the garment is looked at frontally are stiffened. Said parts of the neckband are stiffened by stiffeners which are removable to transform the entire neckband into a limp and washable condition.

The garment in some forms thereof, is ideally suited for wear by clergy with a white clerical collar mounted upon a stock band in the conventional manner, whereby a tonsure or military collar appearance is created. The garment, in other forms thereof, is suitable for use by the laity as a cassock, a shirt for wear with a jabot or cravat and so on, depending on the material used and the colour of the material.

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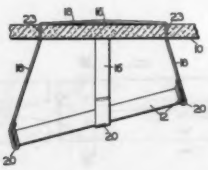
3,585,643
**SUN HAT**
Ruby A. Ryan, 5107 N. Michigan, Portland, Oreg. 97217
Filed June 2, 1969, Ser. No. 829,359
Int. Cl. A42b *1/00*
U.S. Cl. 2—177 1 Claim



A sun hat including a disc having a diameter greater than the head for providing shade for the head and having attaching means arranged to hold the disc flat on the head. The head attaching means in one embodiment includes a flexible head band and a pair of flexible straps having their opposite ends secured to the head band. An intermediate portion of the straps are threaded slidably through slots in the disc whereby such disc is adjustable to different angular positions on the head by relative slidable movement on said straps. In a second embodiment, a single strap is threaded through two pairs of diametrically aligned slots in the discs and is arranged to be tied under the chin. Such second embodiment utilizes a comb connected to the strap adapted for engagement with the hair of the wearer.

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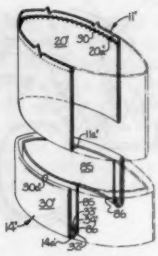
3,585,644
**VARIABLE LENGTH TROUSERS CONSTRUCTION**
George Terrell Bailey, P.O. Box 271, Johnsonville, S.C. 29555
Filed June 25, 1969, Ser. No. 836,268
Int. Cl. A41d *27/10*
U.S. Cl. 2—269 4 Claims



A trousers construction including variable length, tubular trousers legs having a reversely extending fold inside the legs and a separately formed cuff detachably secured at the bottom edge portion of each trousers leg to permit varying the length of the cuffed trousers legs by upward and downward adjustment of the cuffs with respect to the lower edges of the trousers legs and by varying the depth of the reversely extending fold inside the trousers legs.

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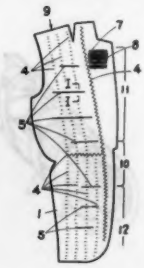
3,585,645
**PROCESSED INTERLINING FOR USE IN GARMENT**
Toshihiro Moriwaki, Suita-shi, Osaka-fu, Japan, assignor to Kabushiki Kaisha Sugiyama, Osaka-fu, Japan
Filed Mar. 12, 1969, Ser. No. 806,396
Claims priority, application Japan, Mar. 30, 1968, 43/25,672; Aug. 7, 1968, 43/56,046; Dec. 11, 1968, 43/90,807
Int. Cl. A41d *27/02*
U.S. Cl. 2—272 12 Claims



This invention relates to a processed interlining for use in a garment, said processed interlining being adapted to

freely produce all forms of swelling required of the garment in an outer fabric of the garment by use of a single sheet of processed interlining by forming a plurality of transverse slits in spaced rows one above another therein and leaving said slits cut open in the processed interlining.

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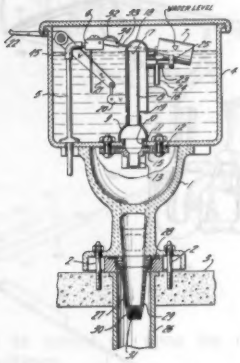
**3,585,646**
**TOILET FLUSHING SYSTEM**
**Emilio Fernandez Lopez, Mexico City, Mexico (249 W. 14th St., New York, N.Y. 10011)**
**Filed Sept. 30, 1968, Ser. No. 763,789**
**Int. Cl. A47k *17/00*; E03l *11/00***
**U.S. Cl. 4—1** **7 Claims**



A toilet flushing system which has a water tank with a discharge device operating according to the syphon principle with an adjustable snifter valve. A discharge accelerating device below the toilet. The whole system is arranged for greater flushing efficiency with a reduced quantity of water.

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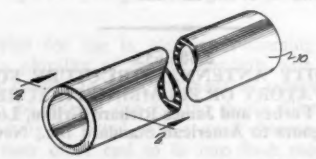
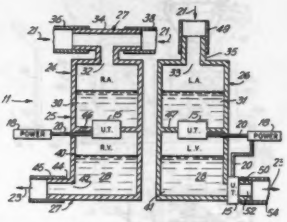
**3,585,647**
**ANTITHROMBOGENIC ARTICLE AND PROCESS**
**Henry M. Gajewski, Morton Grove, and Clarence Gdowski, Cicero, Ill., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.**
**Filed Apr. 25, 1968, Ser. No. 724,155**
**Int. Cl. A61f *1/24***
**U.S. Cl. 3—1** **12 Claims**



A flexible article obtains an anticoagulating character enabling handling of, or contact with, blood by reason of securance of heparin to the surface of the article through the medium of a thereto vulcanized surface cover fabricated from silicone resin with therein entrapped inorganic adsorbant for holding an anticoagulant for blood.

**3,585,648**
**ULTRASONIC METHOD AND APPARATUS FOR PUMPING FLUIDS THROUGH A HUMAN**
**Leonard W. Suroff, Jericho, N.Y., assignor to Ultrasonic Systems, Inc., Farmingdale, N.Y.**
**Filed Dec. 10, 1968, Ser. No. 782,537**
**Int. Cl. A61f *1/24***
**U.S. Cl. 3—1** **28 Claims**



The invention relates to a mechanical heart for pumping blood in humans that utilizes ultrasonic mechanical vibrations for obtaining the pumping motion and also increasing the flow of fluids in the circulatory and other systems of the body.

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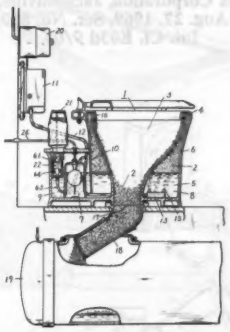
**3,585,649**
**TOILET UNIT UTILIZING SELF-MAINTAINED FOAM**
**Masami Miya, Tokyo, Japan, assignor to Nepon Kabushiki Kaisha Nepon Co., Ltd., Tokyo, Japan**
**Filed July 29, 1968, Ser. No. 748,398**
**Claims priority, application Japan, Nov. 30, 1967, 42/76,563; Apr. 8, 1968, 43/27,718, 43/27,719, 43/27,720, 43/27,721, 43/27,722**
**Int. Cl. A47k *11/00***
**U.S. Cl. 4—9** **6 Claims**



A defecating system in which foam is provided always in a stool and excrement is sealed by the foam visually, odorproofly, and hygienically in the stool just after the excrement is put therein and transferred out of the stool while being wrapped, sealed, and lubricated by the foam, without necessity of the action of an appreciable quantity of water. Specified convenience and equipments for the specified system are also disclosed.

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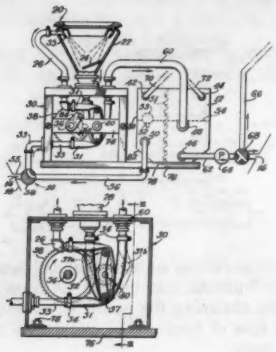
**3,585,650**
**HOSE PUMP AND RECIRCULATING SYSTEM EMPLOYING SAME**
**Robert D. Lekberg, 4040 W. 123rd St., Alsip, Ill. 60658, and Roger Daryl Lekberg, 11110 S. Lawler Ave., Worth, Ill. 60482**
**Filed Jan. 13, 1969, Ser. No. 790,633**
**Int. Cl. E03d *5/01***
**U.S. Cl. 4—90** **15 Claims**

Hose pump, and recirculating system employing same and adapted to retain sewage aboard a craft. The pump

provides for the forced emptying of a toilet and for the storage by the pump of the waste liquid in a recirculating tank. The pump, by drawing surface rinse liquid from the tank, also provides forced flushing of the toilet. The hose pump has separate rinse and waste sections in which the



hose is stretched longer than its normal length, and which afford peristaltic pumping of waste without damage from blockage, and afford retention of a pre-charge of rinse liquid without check valves, and also afford intermittent drawing of waste and a non-spill toilet operation without check valves.

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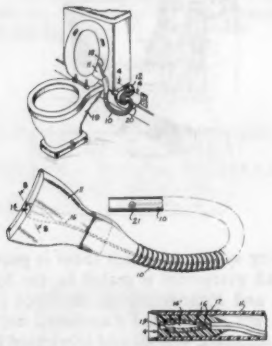
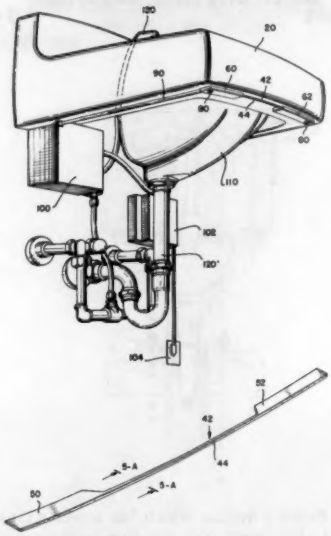
**3,585,651**
**ODOR REMOVER FOR TOILETS**
**David L. Cox, Jacksonville, N.C., assignor to The Cox Corporation, Jacksonville, N.C.**
**Filed Aug. 27, 1969, Ser. No. 853,419**
**Int. Cl. E03d *9/04***
**U.S. Cl. 4—96** **4 Claims**



A device for removing obnoxious odors from a toilet, such device including a hose with an inlet fitting connected to one end for attachment to the underside of the toilet seat near the rear and a discharge fitting at its opposite end for extending through a wall to an exterior air space and with a blower or fan operatively connected to such discharge fitting for producing suction through the hose for withdrawing air from the toilet bowl and discharging it beyond the wall, the inlet fitting having incorporated therein a resilient switch completely encased in plastic with embedded electric contacts adapted to be engaged by the weight of a person on the toilet seat to supply electric current to cause operation of the motor.

**3,585,652**
**PROXIMITY ANTENNA STRUCTURE FOR A LAVATORY OR PLUMBING FIXTURE**
**Norman Arthur Forbes and James Richard Griffin, Louisville, Ky., assignors to American Standard Inc., New York, N.Y.**
**Filed Sept. 10, 1969, Ser. No. 856,667**
**Int. Cl. A47k *1/04***
**U.S. Cl. 4—166** **21 Claims**





A sensing device, often called an "antenna," employed with a capacitance-operated proximity control circuit for a lavatory or other plumbing fixture to detect and respond to the presence or absence of a user in front of the lavatory. The antenna develops an increase in capacitance upon the arrival of the user at the front of the lavatory. The increase of capacitance activates the control circuit which turns on the faucet of the lavatory and keeps it turned on while the user washes his hands and incidentally sways his body. When the user departs from the lavatory, the faucet will be turned off upon the resulting decrease in the capacitance of the antenna.

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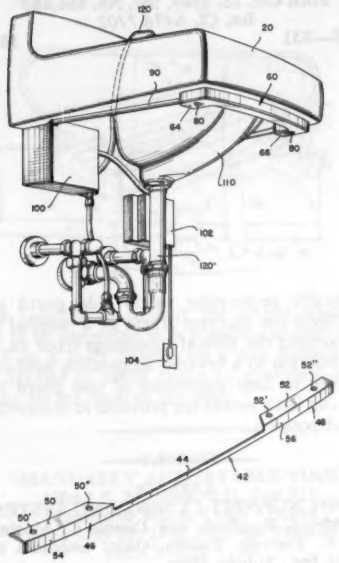
**3,585,653**
**PROXIMITY ANTENNA STRUCTURE FOR A LAVATORY OR PLUMBING FIXTURE**
**Norman A. Forbes and James Richard Griffin, Louisville, Ky., assignors to American Standard Inc., New York, N.Y.**
**Filed Sept. 10, 1969, Ser. No. 856,731**
**Int. Cl. A47k *1/04***
**U.S. Cl. 4—166** **16 Claims**

A sensing device, often called an "antenna," employed with a capacitance-operated proximity control circuit to detect and respond to the presence or absence of a user in front of a lavatory or any other plumbing fixture. The antenna develops an increase in capacitance upon the arrival of the user at the front of the lavatory. The increase of capacitance activates an electronic control circuit which turns on the faucet of the lavatory and keeps

it turned on while the user sways his body in washing his hands. When the user departs from the lavatory, the



faucet will be turned off upon the resulting decrease in the capacitance.

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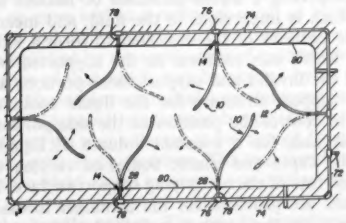
**3,585,654**
**QUICK-DISCONNECT POOL CLEANING APPARATUS**
**Alexander J. Jacobs, 202 Orange Grove, San Fernando, Calif. 91340**
**Filed Sept. 12, 1968, Ser. No. 759,375**
**Int. Cl. B08b *9/00***
**U.S. Cl. 4—172.15** **3 Claims**



A device for use in cleaning swimming pools that utilizes a plurality of flexible conduits with nozzles on one end thereof to keep sediment in suspension in the water to be filtered out by the pool's filtering system. The conduits are fitted with a quick-disconnect type fitting at their other end to fit into flush mounts in the side of the pool.

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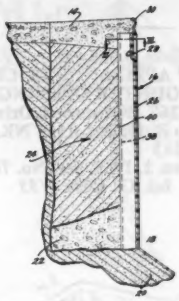
**3,585,655**
**SWIMMING POOL CONSTRUCTION**
**Jay A. Lankheet, Holland, Mich., assignor to Glamour Pools Company, Holland, Mich.**
**Filed Nov. 19, 1968, Ser. No. 776,872**
**Int. Cl. E04h *3/16***
**U.S. Cl. 4—172** **4 Claims**

This disclosure relates to a swimming pool construction comprising a plurality of interconnected upper wall sections and a flexible plastic liner secured to the upper portion of the upper wall sections. Each wall section has at least one reinforcing and anchoring rib extending rearwardly and then laterally of each wall section to anchor the rib in concrete footings at the top and bottom of



the wall section. A recessed channel is formed at the top portion of each wall section. A plastic liner is adjustably secured in the recessed channel by a tile or similar insert and a fastening device which extends through the tile and into the wall section.

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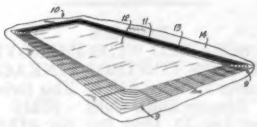
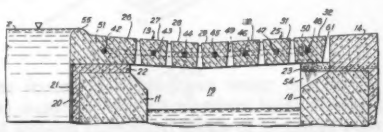
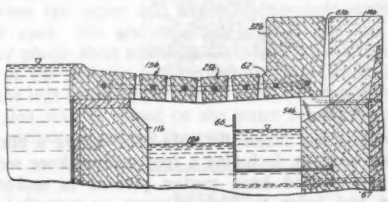
**3,585,656**
**SWIMMING POOL COPING CONSTRUCTION**
**Milton Costello, 1400 Wantagh Ave., Wantagh, N.Y. 11794**
**Filed Mar. 27, 1969, Ser. No. 811,106**
**Int. Cl. E04h *3/16, 3/18***
**U.S. Cl. 4—172.21** **30 Claims**







This invention relates to a swimming pool including a water retaining inner wall, an outer wall spaced outwardly

from the inner wall and combining with the latter to define a trench, and a coping in bridging relation with the trench, the coping having through overflow openings for passing overflow water through the coping to the trench and said coping comprising coping sections of integral construction which extend between the inner and outer walls.

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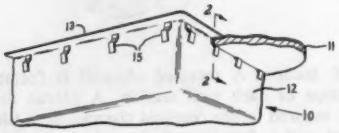
**3,585,657**
**SPRING CLIP APPLIANCE MOUNTING IN A COUNTER OPENING**
**Alfred C. Jensen, 267 Wedgewood Drive, Eugene, Oreg. 97402, and Gino R. Quilici, 1135 NE. 80th Ave., Portland, Oreg. 97213**
**Filed Dec. 2, 1968, Ser. No. 780,361**
**Int. Cl. E03c *1/33***
**U.S. Cl. 4—187** **3 Claims**



Several modifications are described. In each embodiment the spring clips are mounted directly on the appliance, such as a sink, without requiring a separate mounting frame. The clips may be adhesively secured to the vertical edge surface of the counter, they may hook under the counter, they may hook into a groove in the edge of the counter or they may be equipped with a sharp chisel edge to bite into the edge surface of the counter.

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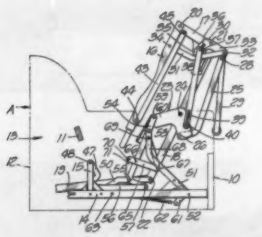
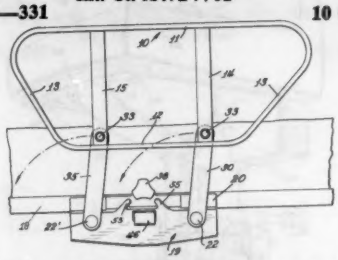
**3,585,658**
**FOLDING SOFA-BED WITH IMPROVED HEAD SECTION CONTROL LINKAGE**
**Melvin P. Spitz, 619 N. Elm Drive, Beverly Hills, Calif. 90210**
**Filed Apr. 21, 1969, Ser. No. 817,730**
**Int. Cl. A47c *17/14***
**U.S. Cl. 5—13** **12 Claims**



A folding bed frame for sofa-beds having a plurality of frame sections, including a foot section, knee section, trunk section and head section pivoted in end-to-end relation and being foldable between an extended bed-forming position and a retracted sofa seat-forming position; including support and guiding linkage assemblies for determining the path of movement of the trunk section; and head section actuating link means connected between one of the support linkage assemblies and the head section operative to variably control the speed and amplitude of swinging movement of the head section within the space behind the sofa back center rail, in a manner to permit utilization of a head section having greater length than is possible with conventional sofa-bed structures.

**3,585,659**
**SAFETY SIDE GUARD FOR HOSPITAL BEDS**
**Francis J. Burst and John M. Sharer, Batesville, Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.**
**Filed Oct. 15, 1969, Ser. No. 866,683**
**Int. Cl. A47d *7/02***
**U.S. Cl. 5—331** **10 Claims**



A generally rectangular safety side guard pivotally mounted upon the mattress frame of a hospital bed and movable around the pivotal mountings from an elevated guarding position to a lowered inoperative position. Stops are provided to limit movement of said guard into said positions and latch means are provided to secure the guard in elevated position.

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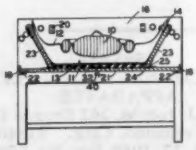
**3,585,660**
**BODY SUPPORT CUSHIONING SYSTEM**
**Max Gottfried, Rossford, and Dennis G. Mosiniak and Ansis V. Tenteris, Toledo, Ohio, assignors to Jobst Institute, Inc., Toledo, Ohio**
**Filed Mar. 26, 1969, Ser. No. 810,678**
**Int. Cl. A47c *27/08*; A61g *12/00***
**U.S. Cl. 5—348** **14 Claims**



A cushion for uniformly distributing support of an invalid comprising a liquid container of flexible sheet material which is impervious to the fluid, and means to elevate side portions of the container to form a loose upper surface which can conform to the supported body portions of the invalid and support those portions as inflotation. A support structure for the liquid container is arranged to control the position of the side portions of the container and, for a constant volume of liquid therein, adjust the depth and enable bodies of varying weight to be floated free of the underlying support surface. Restraining means are provided for the container to maintain its orientation on the support surface during manipulations of the container and invalid. A cushioning pad accommodates the container restraining means and container positioning means while minimizing discomfort to the user.

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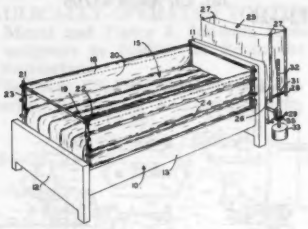
**3,585,661**
**BODY SUPPORT CUSHIONING SYSTEM**
**Max Gottfried, Rossford, and Dennis G. Mosiniak and Ansis V. Tenteris, Toledo, Ohio, assignors to The Jobst Institute, Inc., Toledo, Ohio**
**Filed Aug. 28, 1968, Ser. No. 756,074**
**Int. Cl. A47c *27/08***
**U.S. Cl. 5—348** **13 Claims**

A cushion for uniformly distributing support of an invalid comprising a liquid container of flexible sheet material impervious to the fluid, and means to elevate side portions of the container to form a loose upper surface which can conform to the supported body portions of the

invalid. The cushioning portion of the liquid container communicates with a reservoir which can be raised and lowered to fill and drain the cushion and can be elevated sufficiently to develop a hydrostatic head balancing the



pressure required to support the invalid where the invalid is to be supported with pressures greater than those imposed on a body floating on a free surface. The pad can be applied to wheel chairs by providing a reservoir extending up the back of the chair.

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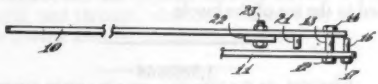
**3,585,662**
**MANUALLY ACTUATABLE TOOL**
**Alfred Z. Boyajian, P.O. Box 811, Manhattan Beach, Calif. 90266**
**Filed May 20, 1968, Ser. No. 730,570**
**Int. Cl. B25f** *1/04*
**U.S. Cl. 7—14.1** **7 Claims**



An implement, by means of which stiff rod or wire, for example, of metal, including hard steel as well as other materials, and also including smooth rods or wires which have been screw-threaded, may be severed cleanly, leaving but little burr, or in accordance with another embodiment, may not only be cut but, if desired, bent through an angle of 180° or more and to a radius as small as ½ the diameter of the rod, and wherein such cutting and/or bending are accomplished by the application of manual force within the range of that which may be exerted by an ordinary workman. The implement includes an elongated base member and an elongated handle member pivotally secured to one another by a post adjacent to but spaced from the corresponding ends of the members. The base member pivotally mounts a rigid cutter having a non-cutting edge and a cutting edge and a pivotal axis parallel to that about which the handle swings. The handle member carries a force applying element for alternatively applying force to (1) the non-cutting edge of the cutter to cause the cutting edge of the cutter to cooperate with a cutting edge on the base member to sever a rod or (2) to a rod for bending the same about the post.

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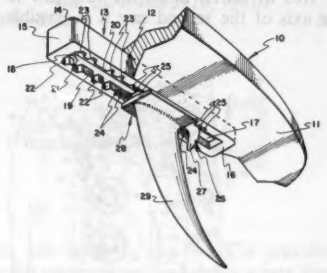
**3,585,663**
**LONGITUDINALLY ADJUSTABLE SURFBOARD FIN WITH SELF-CONTAINED LOCKING MECHANISM**
**Robert Karl Johnson, Ventura, Calif., assignor to W.A.V.E. Corporation**
**Filed Aug. 13, 1969, Ser. No. 849,738**
**Int. Cl. A63c** *15/00*
**U.S. Cl. 9—310** **10 Claims**

Secured within the rearward underside section of a surfboard is a surfboard fin mounting box with a channel and a pair of longitudinally extending runners formed in their margins with cutaway zones that define a keyway. A wedge-shaped block has tabs defining a key sized to fit through the keyway. A fin base has a section that also



has tabs defining a key sized to fit through the keyway. A push arm coupled to the wedged-shaped block can be manually operated to force the wedge-shaped block into tight interlocking relationship with the fin base in order to securely position a fin attached to the fin base.

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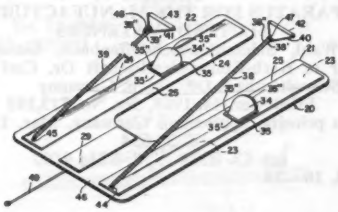
**3,585,664**
**U-SHAPED WATER SKI**
**Allan E. Thompson, Devils Lake, N. Dak. 58301**
**Filed Sept. 5, 1969, Ser. No. 855,509**
**Int. Cl. A63c** *15/00*
**U.S. Cl. 9—310** **3 Claims**



The invention comprises a water sled having a pair of ski members, said ski members being formed of elongated wooden planks and a pair of U-shaped plastic sheet members, having its leg portions covering the upper and lower surfaces of the planks, a third plank is interposed between the upper and lower plastic sheet members at their apex, ribs are mounted beneath the legs of the lower plastic sheet members and ropes are attached to the top of the sled for an operator to grasp while standing on the legs of the upper plastic sheet member whereupon the sled may be towed on the water behind a boat with the operator standing thereon.

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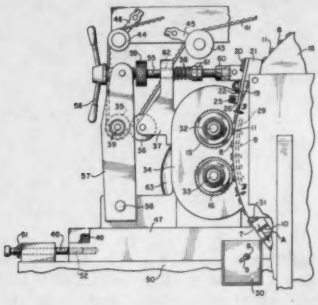
**3,585,665**
**SCREW SLOTTING MACHINE**
**Warren M. Jackson, 5013 Sovereign Blvd., Rockford, Ill. 61108**
**Filed June 25, 1969, Ser. No. 836,245**
**Int. Cl. B23g** *9/00*
**U.S. Cl. 10—6** **16 Claims**

Two circular saw blades of the same diameter are employed in spaced coplanar relationship turning in opposite directions. The first saw is thinner and cuts a preliminary slot along a wavy line as a result of its being oscillated slightly in the plane of cutting, and it leaves

a burr at the outgoing end of the slot which is at a slight elevation relative to the ultimate bottom of the slot. The second saw is thicker and makes a finish cut to the desired width and, due to climb cutting, clips off the burr left by the first saw, so that the slotted screws are substantially free of burrs. Since the first saw is oscillated about the axis of the second saw it is possible to adjust



the depth of the first cut to the desired extent, although both saws may be adjusted together toward the work to compensate for wear on the saws, and later away from the work when new saws are installed. An aligner may be provided using the flats on the hex-heads for aligning to insure cutting of the slots the large diameter from point to point of the hex.

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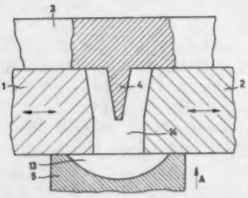
**3,585,666**

## APPARATUS FOR THE MANUFACTURE OF SLOTTED FASTENERS

**Artur Wahl, Schnaittenbach-Offenbach, Germany, assignor to Kerb-Konus-Gesellschaft Dr. Carl Eibes & Co., Schnaittenbach-Offenbach, Germany**

**Filed Mar. 14, 1968, Ser. No. 713,195**
**Claims priority, application Germany, Mar. 18, 1967, E 33,634**
**Int. Cl. B21k *1/58;* B23g *9/00***
**U.S. Cl. 10—24** **4 Claims**



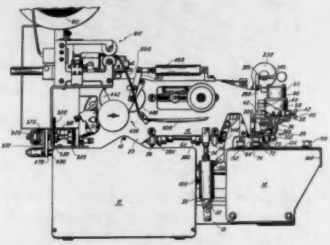
A workpiece is placed in a shaping die set adapted to form a fastener head and shank having one or more internal slots extending inwardly from the free end of the shank. Each such slot has an interior relatively narrow base and diverging sides which widen from the base toward the free end of the shank. The shank also has outwardly diverging lugs spaced from one another by said slot or slots. The shaped workpiece is removed from the die set, and the diverging lugs are then compressed toward the axis of the shank to reduce the diameter of the slotted shank section, and to render the slot sides essentially parallel, or converging to one another. The die set may also include a special head forming die adapted to produce a central recess extending through the fastener head and along the shank toward the internal slots.

**3,585,667**

## AUTOMATICALLY OPERATED RIB APPLYING MACHINE HAVING RIB NOTCHING MECHANISM

**Horst M. Leonhardt, Boston, Mass., assignor to Jacob S. Kamborian, Jr., Lincoln, Mass.**

**Filed Dec. 2, 1969, Ser. No. 881,348**
**Int. Cl. A43d *43/06***
**U.S. Cl. 12—20** **7 Claims**



A machine for applying a length of a rib strip along the periphery of an insole. The machine is so constructed as to feed the insole past a rib applying mechanism. The insole is swung, as it is fed, in response to the sensing of the insole periphery orientation by an edge gage so as to move the insole periphery in a desired path past the rib applying mechanism. A control is provided to operate the machine in response to the presentation of the insole to the gage. A notching mechanism is provided to cut a notch in that part of the inner flange of the rib that is applied to the toe of the insole.

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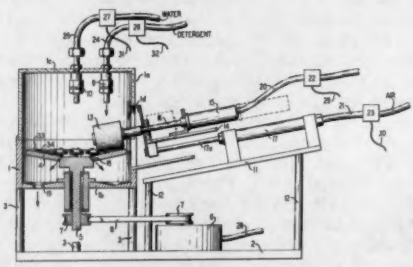
**3,585,668**

## BRUSH CLEANING APPARATUS FOR SEMICONDUCTOR SLICES

**Ralph J. Jaccodine, Allentown, and Donald R. Oswald, Schnecksville, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed June 2, 1969, Ser. No. 829,312**
**Int. Cl. A46b *13/04***
**U.S. Cl. 15—21** **10 Claims**




Semiconductor slices are cleaned in an apparatus which performs the operations of brushing with a cleaning agent, impact rinsing, and spin-drying. A plurality of slices are mounted on a rotating disc near its periphery so that they pass under a rotating scrubbing brush and under nozzles which successively dispense cleaning solution and rinsing water onto the slices. The brush is movably mounted so that it may retract along its axis of rotation to a position away from the slices during rinsing and drying. Drying is accomplished by substantially increasing the speed of the rotating disc so as to fling residual matter therefrom. The

resulting slices are substantially free of dirt particles, stains and fingerprints, making them suitable for use in various semiconductor devices.

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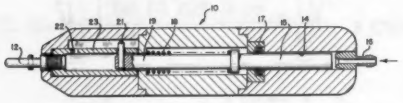
3,585,669
**HYDRAULICALLY-OPERATED TOOTHBRUSH**
Michel A. Moret and Pierre J. Jousson, Geneva, Switzerland, assignors to Institut de Recherche WOOG, Geneva, Switzerland
Filed Sept. 29, 1969, Ser. No. 861,971
Claims priority, application Switzerland, Oct. 3, 1968, 14,801/68
Int. Cl. A46b *3/06*
U.S. Cl. 15—22 6 Claims



A hydraulically-operated toothbrush has a piston arranged to be reciprocated by pulsating liquid. A shaft for carrying a toothbrush head is mounted for rotational oscillation. A coupling between the piston and the shaft oscillates the shaft at a multiple of the reciprocating frequency of the piston. One specific coupling is a pin and slot connection wherein the slot has successive sections extending in opposite angular directions. Another uses a plunger to oscillate the shaft, and the piston has an arm which reciprocates the plunger directly during a portion of its cycle, and through additional means such as a rocking lever during another portion of its cycle.

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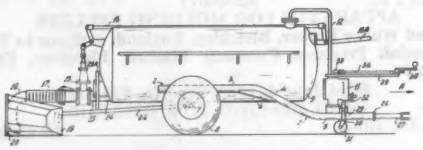
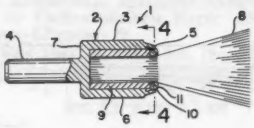
3,585,670
**AGRICULTURAL IMPLEMENTS FOR THE COLLECTION AND TRANSPORT OF LIQUID AND SEMI-LIQUID MATERIALS**
Ian Archie MacKinnon, Burlington, Ontario, Canada, assignor to Lely Ltd., Burlington, Ontario, Canada
Filed Sept. 16, 1968, Ser. No. 759,920
Claims priority, application Netherlands, Sept. 14, 1967, 6212561
Int. Cl. A01c *3/04*
U.S. Cl. 15—93 9 Claims



A manure collector and spreader having a suction pipe at the apex of the V-shaped scraper which is carried by a mobile tank, the suction pipe being detachably connected to a pipe extending from the lower part of the tank and the scraper also having a rapid detachable mounting relative to the tank. In place of the suction pipe a spreading means may be attached to the pipe leading from the manure tank, such spreading means comprising a V-shaped pipe with deflectors at both outer ends of the pipe. An air pump is connected to the tank so that selectively its suction and discharge can be applied to the tank in order to create a pressure or partial vacuum in the tank as desired.

3,585,671
**ROTARY BRUSH**
Arthur T. Schofield, Brecksville, Ohio, assignor to The Manufacturers Brush Company, Cuyahoga County, Ohio
Filed Sept. 27, 1968, Ser. No. 763,238
Int. Cl. A46b *3/10, 13/02*
U.S. Cl. 15—180 25 Claims



A rotary end brush or cup brush is provided with a durable collar surrounding the bristles where they emerge from the bristle holder; the collar having a smooth convexly curved bristle support surface (e.g., as an O-ring) for supporting the bristles when they flare during brush rotation; the bristle support surface being elastomeric and having a hardness in excess of about 50 Shore A durometer; the collar being reinforced against expansion (e.g., by locating it at least partially within the bristle holder); and the bristle holder being constructed of either metal or plastic.

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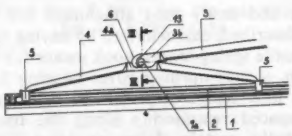
3,585,672
**STIRRUP CONNECTION FOR WINDSHIELD WIPERS**
Roger Habert, Paris, France, assignor to Ducellier & Cie, Paris, France
Filed June 12, 1969, Ser. No. 832,652
Claims priority, application France, June 18, 1968, 155,439
Int. Cl. B60s *1/04, 1/34;* A47l *1/00*
U.S. Cl. 15—250.32 6 Claims



The connections between the main and intermediate stirrups of a windshield wiper blade include a rubber bushing having side cheek pieces or flaps which fit between the legs of the main stirrup and the side walls of the intermediate stirrup while the usual pivot pin joins the stirrups. The main body of the bushing is frictionally held within an opening in the intermediate stirrup and forms an abutment or stop for the main stirrup. A tail piece of the bushing snaps into another opening in the intermediate stirrup and completes the frictional interlock of the bushing.

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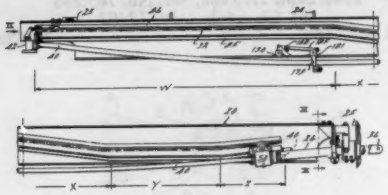
3,585,673
**LONG RETRACTING SOOT BLOWER WITH LOCKING GEAR DRIVE**
John E. Nelson, John R. Saltz, and Robert E. Chappell, Lancaster, Ohio, assignors to Diamond Power Specialty Corporation, Lancaster, Ohio
Original application Sept. 9, 1965, Ser. No. 486,121, now Patent No. 3,439,376, dated Apr. 22, 1969. Divided and this application Dec. 3, 1968, Ser. No. 798,836
Int. Cl. F23j *3/02*
U.S. Cl. 15—317 2 Claims

A long travel soot blower has a unitary motor-gearbox-carriage assembly for projecting and retracting the lance

tube, the gearing being so arranged that the lance tube cannot be moved by the pressure of the blowing medium. The carriage, lance tube and feed tube are supported to



provide sag-offsetting vertical displacement of the carriage and lance and to provide roller support with minimum friction.

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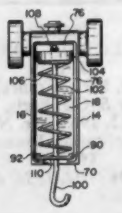
**3,585,674**
**ROLLER MOUNTED CURTAIN SLIDER**
**Jerrold E. Golden, 54 E. Terra Cotta Ave., Crystal Lake, Ill. 60014**
**Filed Apr. 25, 1969, Ser. No. 819,386**
**Int. Cl. A47h *15/02***
**U.S. Cl. 16—87.6** **7 Claims**



A simple and easily used attachment for suspending curtains is described, characterized by having free-running rollers, versatile spring-loaded hook means for attachment to a curtain, a snap-opening cover housing for easy assembly and interchange of parts, and means to hold the sliders in spaced relationship along the track. In one embodiment the curtain slider mounting is adapted to suspend curtains at an angle between tracks at the top and bottom edges of the curtains which are not in the same vertical plane. In another embodiment means are provided to suspend the curtain from the slider in a pleated arrangement from tabs, hooks or button snaps and maintain the pleated arrangement of the curtain at all times. Pleat-forming reinforcing means as also disclosed. Other embodiments are disclosed.

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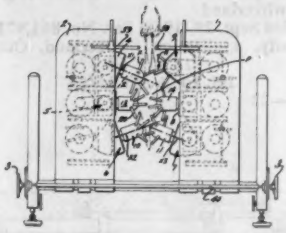
**3,585,675**
**POULTRY PICKER**
**Edward J. Crane, Ottumwa, Iowa, assignor to International Agri-Systems, Inc., Ottumwa, Iowa**
**Filed Aug. 16, 1968, Ser. No. 753,251**
**Int. Cl. A22c *21/02***
**U.S. Cl. 17—11.1** **10 Claims**

A poultry picker machine for picking feathers from poultry suspended from overhead and carried through the machine. Positioned on each side of the path of travel of the poultry through the apparatus are a plurality of finger supports supporting a plurality of flexible fingers extending in at least three directions, that is, extending in a direction substantially perpendicular to the axis of rotation, in a direction askew to said axis, and in a direction parallel to such axis. Each of the supports are rotatable about axes orientated generally toward the path of travel of the bird. The finger supports are arranged in three banks, the upper and lower bank having their axes of rotation inclined downwardly and upwardly, respectively. On one side of the travel path opposite an upper bank is a rotatable drum-type finger support having a plurality of fingers extending radially therefrom.



The banks of finger supports are arranged to be adjustable as one unit. The assembly forming the bank is a single gear box assembly so that all of the finger supports of each bank are driven by one motor which is mounted on the assembly so that when adjusted the motor moves with the assembly.

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**ERRATUM**

For Class 17—24 see:
Patent No. 3,585,724

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**3,585,676**
**MICROWAVE PROCESS FOR SHUCKING BIVALVE MOLLUSKS**
**Barry W. Spracklin, Wakefield, Mass., assignor to the United States of America as represented by the Secretary of the Interior**
**No Drawing. Filed July 17, 1969, Ser. No. 842,723**
**Int. Cl. A22c *29/00***
**U.S. Cl. 17—48** **4 Claims**

Bivalve mollusks are exposed to microwave radiation in doses of controlled duration and intensity to slightly open, or gape, their shells so that the flesh can easily be removed. Both single and multiple controlled exposures are employed effectively.

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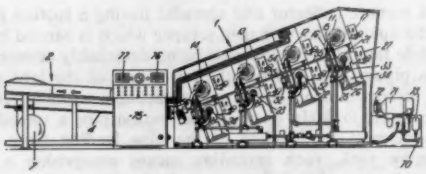
**3,585,677**
**APPARATUS FOR MOLDING PELLETS**
**Alfred Walter Barker, Bletchley, England, assignor to The Sandall Precision Company Limited, Bletchley, England**
**Filed June 4, 1969, Ser. No. 830,435**
**Int. Cl. B29c *3/02, 3/06;* B29d *7/10***
**U.S. Cl. 18—1** **10 Claims**



The disclosure concerns the moulding of pellets from materials of varying hardness and adhesiveness, particularly so-called "high boiled glucose" by rolling the ma-

terial to a continuous sheet and thereafter rolling longitudinal grooves and transverse grooves in a surface of the sheet by successive roll pairs, the rolls of the roll pairs being maintained at selected separations by pressure fluid-operated adjustment means responsive to departure of roll separation from selected value.

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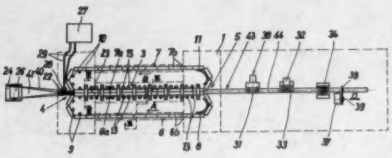
**3,585,678**

## APPARATUS FOR MANUFACTURING LONGITUDINALLY SPLIT FOAM INSULATING TUBES

**Peter Neumann, Fichtenweg 7, Buchs, St. Gallen, Switzerland, and Horst Roland Strobl, 8 Sudliche Munchner Strasse, 8022 Grunwald, near Munich, Germany**

**Filed Nov. 20, 1967, Ser. No. 684,284**
**Claims priority, application Germany, Nov. 21, 1966, N 29,534**
**Int. Cl. B29c *1/00***
**U.S. Cl. 18—4** **5 Claims**



A method and apparatus for producing foam insulating tubes having a longitudinal slit where there is provided a fixed inner mold core and a moving outer mold. A foil member surrounds the inner core and a second foil member is aligned with the inside of the outer mold. The foam material is then continuously foamed in place as the foil members and the outer molds advance. A foam insulating tube having a longitudinal slit, a foil outer covering, a foil inner surface and a foil covering on the surfaces of said slit.

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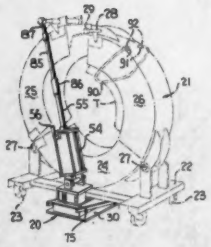
**3,585,679**

## MOLD LOADER

**Donald M. MacMillan, deceased, late of Macon, Ga., by Kenneth T. MacMillan, trustee, Macon, Ga., assignor to MacMillan Mold Co., Inc., Macon, Ga.**

**Original application Apr. 11, 1963, Ser. No. 272,376, now Patent No. 3,429,005. Divided and this application Dec. 20, 1968, Ser. No. 785,815**
**Int. Cl. B29h *5/04***
**U.S. Cl. 18—2TT** **20 Claims**



This disclosure relates to a mold loader having a base adapted to be positioned beneath a generally oval-shaped tire mold, a pair of arms pivotally joined to the base, and a third arm connected therebetween and spanning through an opening of the tire mold, the third arm carries a force-applying member in the form of a screw, and one of the pair of arms is retractable to decrease the distance between the screw and a tire within the mold to set the same therein.

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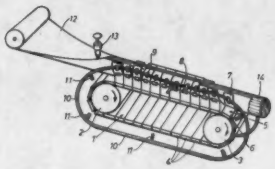
**3,585,680**

## ARRANGEMENT FOR THE CONTINUOUS PRODUCTION OF SHAPED LENGTHS OF FOAM PLASTICS

**Karl-Heinz Eisenmann, Bergisch-Neukirchen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed May 19, 1969, Ser. No. 835,282**
**Claims priority, application Germany, May 20, 1968, P 17 78 651.5**
**Int. Cl. B29c *17/00***
**U.S. Cl. 18—4** **8 Claims**



Apparatus suitable for continuous production of elongated shaped elements of foam plastics. A single jointed-band, endless conveyor having shaping mould elements mounted on the conveyor belt members is employed. The shaping mould elements each include a hinged section which is guided into and out of the moulding position along one flight of the conveyor.

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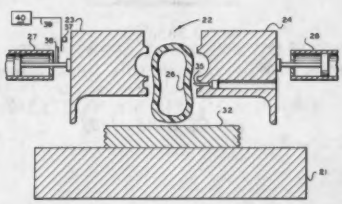
**3,585,681**

## BLOW MOLDING APPARATUS

**Tony E. Branscum, Winfield, Kans., and Bill T. Morgan and Donald L. Peters, Bartlesville, Okla., assignors to Phillips Petroleum Company**

**Filed June 5, 1967, Ser. No. 643,572**
**Int. Cl. B29d *23/03***
**U.S. Cl. 18—5** **4 Claims**



A hollow object having an integral hollow adjunct portion is formed by blow molding. Two mold parts pinch off a portion of the parison to form the adjunct, and the remainder of the parison forms the main body of the blown object.

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**3,585,682**

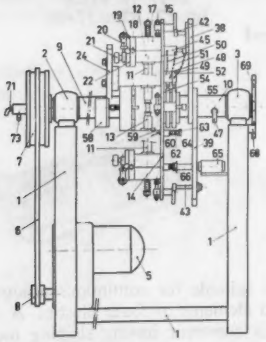
## BLOW-MOLDING APPARATUS FOR MOLDING HOLLOW PLASTIC ARTICLES

**Nerio Martelli, Bologna, Italy, assignor to Solvay & Cie, Brussels, Belgium**

**Filed Nov. 19, 1968, Ser. No. 776,968**
**Claims priority, application Belgium, Nov. 22, 1967, 51,168**
**Int. Cl. B29d *23/03***
**U.S. Cl. 18—5** **14 Claims**

Rotary blow-molding apparatus in which a plurality of molds are disposed in an arrangement in which they are moved along a closed path at constant speed and during

their travel each receive a section of a parison continuously extruded in timed relationship with the travel of the continuously traveling molds. The parison sections are blow-molded in the individual cavities of the molds automatically by automatic insertion into the cavity of a needle on each mold and retraction therefrom. Pressure fluid is applied to the molds through the needles successively as they move along the closed path for blow-molding hollow articles joined at their necks. A pair of trimming flexible blades are disposed between two successive or next adjacent molds to trim excess material from the



mold bottoms. The blades are driven by a piston activating the blades automatically during rotary travel of the molds. The molds each have a fixed half mold and a mobile half mold hinged on the fixed half mold jointly defining a mold cavity for forming hollow articles joined at their necks. Opening and closing of the molds is accomplished by a camming guide path in which are successively received cam followers operating the mobile half molds progressively opening and closing them and an ejector in each mold is actuated for ejecting the molded articles. Each control operation is executed cyclically as the molds are moved continuously along the closed path.

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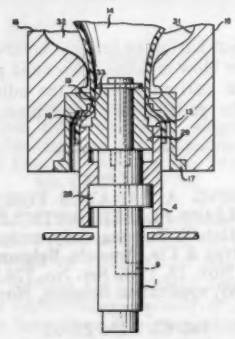
**3,585,683**
**BLOW MOLDING APPARATUS**
**Newton R. Wilson, Bartlesville, Okla., assignor to Phillips Petroleum Company**
**Filed Mar. 11, 1968, Ser. No. 712,282**
**Int. Cl. B29d *23/03***
**U.S. Cl. 18—5** **3 Claims**



A blow molding apparatus comprises an exterior neck mold positioned in separable mold halves at one extremity of the mold cavity and axially reciprocally mounted interior neck molding means comprising an interior neck mold and circumferentially disposed sleeve as an interior lip mold, the interior neck mold being axially retractable relative to said sleeve and a fluid conduit within said interior neck mold communicating between the interior of said mold cavity and a fluid source.

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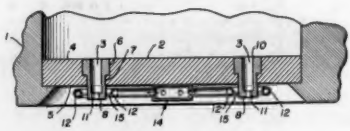
**3,585,684**
**SPINNERET FOR MAKING COMPLEX HOLLOW FILAMENTS**
**Euell K. McIntosh and Paul T. Howse, Jr., Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.**
**Original application Dec. 23, 1966, Ser. No. 604,287, now Patent No. 3,465,618. Divided and this application Feb. 3, 1969, Ser. No. 795,871**
**Int. Cl. D01d *3/00***
**U.S. Cl. 18—8** **5 Claims**



Melt spinning spinnerets are made by forming in a spinneret a hole of two different diameters. A hollow insert is press-fitted in the hole so that the insert extends slightly below the plane of the extrusion face of the spinneret. The insert has a counterbore communicating with a series of small passageways extending to the point of extrusion where the passageways form a pattern adapted to produce a textile filament by the coalescence of a cluster of small streams of polymer at a point below the spinneret face. The resulting filaments have a multitude of lobes and axially extending voids. During employment of the spinneret, rings surrounding the individual filaments can be used to supply a cooling fluid to solidify the filaments in a controlled manner shortly after the emergence of the streams of molten polymer from the spinneret.

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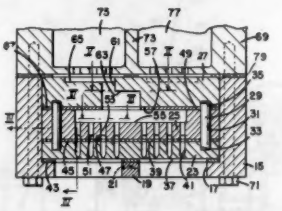
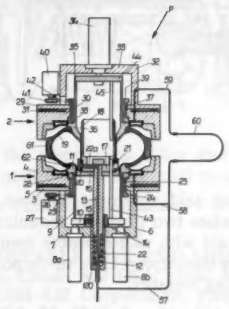
**3,585,685**
**SPINNERET ASSEMBLY FOR MAKING COMPOSITE FILAMENTS**
**Henry J. McDermott, Collingdale, Pa., assignor to FMC Corporation, Philadelphia, Pa.**
**Filed July 1, 1969, Ser. No. 838,223**
**Int. Cl. D01d *3/00***
**U.S. Cl. 18—8** **9 Claims**



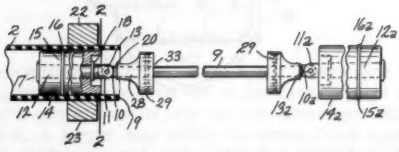
A spinneret assembly for producing composite filaments having sharply defined components or segments extending longitudinally thereof in side-by-side relationship.

**3,585,686**
**APPARATUS FOR RENEWING THE CIRCULAR SHAPE OF VEHICLE TIRES**
**Walter Balle, Dornigheim, Germany, assignor to Firma Leonhard Herbert Maschinenfabrik**
**Filed Aug. 12, 1969, Ser. No. 849,413**
**Int. Cl. B29h *5/04***
**U.S. Cl. 18—18F** **16 Claims**



Apparatus for renewing the circular shape of vehicle tires in a divided vulcanizing mold which lies against the tire essentially only in the area of the tread of the tire.

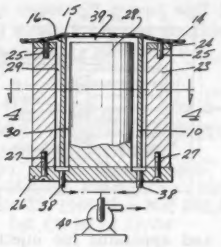
**3,585,687**
**PIPE FLARING TOOL**
**Bengt G. Bjalme, Erie, Pa., assignor to Reed Manufacturing Company, Erie, Pa.**
**Filed Feb. 4, 1969, Ser. No. 796,518**
**Int. Cl. B29c *17/00***
**U.S. Cl. 18—19TE** **15 Claims**



A pipe flaring tool in which the pipe to be flared is solidly gripped against an internal arbor or mandrel while the flaring is accomplished by a spinning tool journaled in the mandrel and rotated about the axis of the pipe while the angle of contact of the spinning tool is progressively increased. In the case of plastic pipe such as polybutylene, polyethylene, polyvinyl, etc., used for domestic water service, the angle of the spinning tool at the end of the flaring operation is substantially 90° and when the tool is removed, the flare springs back to an angle of substantially 45° so as to fit a standard compression fitting.

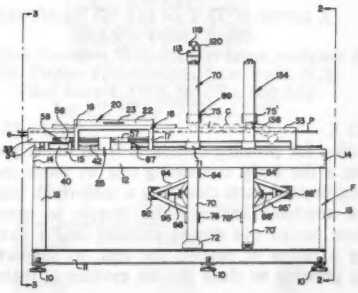
**3,585,688**
**APPARATUS FOR APPLYING PLASTIC ENDS TO CONTAINER BODIES**
**Carlton A. Richie, Toledo, Ohio, assignor to Owens-Illinois, Inc.**
**Original application Jan. 6, 1967, Ser. No. 607,744, now Patent No. 3,493,640, dated Feb. 3, 1970. Divided and this application Aug. 6, 1969, Ser. No. 847,912**
**Int. Cl. B29c *17/00***
**U.S. Cl. 18—19** **6 Claims**

An apparatus for forming a sheet material into a container end cover and simultaneously sealingly attaching the end cover about the rim of the container. The apparatus includes a cylindrical member having a height less than the height of the container to be covered and an internal diameter greater than the container diameter, such that when the container to be covered is located in the



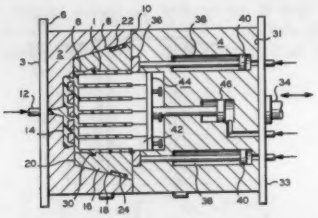
apparatus, a gap exists between the cylindrical member and the container; means are also provided for creating a vacuum in this gap whereby a formable plastic sheet material overlying the container rim and upper surface of the cylindrical member is drawn into the gap and brought into engagement with the container side surface.

**3,585,689**
**COMPACT DIFFERENTIAL PRESSURE FORMING MACHINE**
**Gaylord W. Brown and Bradley A. Schnepp, Beaverton, Mich., assignors to Koehring Company, Milwaukee, Wis.**
**Original application Oct. 5, 1966, Ser. No. 584,436, now Patent No. 3,513,505, dated May 26, 1970. Divided and this application July 30, 1969, Ser. No. 868,256**
**Int. Cl. B29c *3/06, 17/02*; B30b *1/16***
**U.S. Cl. 18—19** **13 Claims**



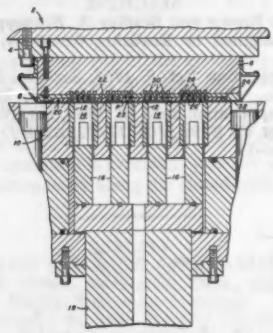
A differential pressure forming machine for forming shapes in a sheet of deformable thermoplastic material including molds on opposite sides of the sheet; at least one of the molds having a mold cavity and one mold being movable relative to the other to substantially engage and separate the molds. The upper mold has a platen frame with a lower portion disposed below the lower mold, and expansible and contractible mechanism is sandwiched between the lower mold and lower portion of the upper mold platen frame and is operated to sequentially move the molds in opposite directions toward the sheet.

**3,585,690**
**APPARATUS FOR INJECTION MOLDING AND EJECTION OF PLASTIC ARTICLES**
**Alvin S. Tucker, Dexter, Mich., assignor to Phillips Petroleum Company**
**Filed July 1, 1969, Ser. No. 838,268**
**Int. Cl. B29f 1/00**
**U.S. Cl. 18—30** **8 Claims**



A method and apparatus for injection molding and ejecting plastic articles from the mold whereby the article is separated from the mold elements in stages and the forces of ejection are reduced and distributed over several portions of the molded article.

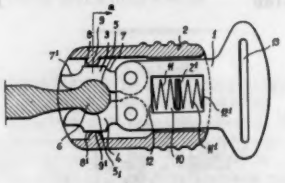
**3,585,691**
**DIE CONSTRUCTION**
**Loren M. Wingblade, Woodstock, and Donald O. Schwennesen, Crystal Lake, Ill., assignors to The Arnold Engineering Company, Marengo, Ill.**
**Filed May 12, 1969, Ser. No. 823,685**
**Int. Cl. B29c 1/00**
**U.S. Cl. 18—34** **5 Claims**



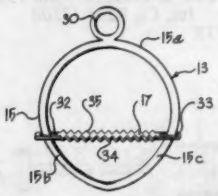
Tooling for pressing compacts from moist powders including a die body containing one or more cavities for forming pressed parts closed by a semi-rigid, load-bearing seal of urethane having holes therein to carry off the moisture forced out during pressing and a fixture plate, having a recess to receive the seal, to support the seal during pressing to close the die cavities at their edges.

**3,585,692**
**SAFETY BELT BUCKLES**
**Noel le Mire, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, and Automobiles Peugeot, Paris, France**
**Filed July 30, 1969, Ser. No. 846,125**
**Claims priority, application France, Aug. 1, 1968, 161,497**
**Int. Cl. A44b 11/25, 17/00**
**U.S. Cl. 24—230** **4 Claims**

A safety belt buckle for automobile or aircraft use, of the type comprising on the one hand an anchoring member engageable by a U-shaped abutment member or eyelet and on the other hand a member movable in two opposite directions with respect to said anchoring member normally urged to its latching position by a spring. The movable member is adapted to be brought against the resistance of said spring to an opening position for releasing or engaging said abutment member. The anchoring member comprises two pivotally mounted retaining arms adapted to co-act with said movable member constituting a socket or the like, irrespective of its position in relation to said anchoring member.



**3,585,693**
**CLAMPING DEVICE**
**Ronnie William Barnhardt, 141 Swink St., Concord, N.C. 28025**
**Filed Apr. 10, 1969, Ser. No. 814,915**
**Int. Cl. A44b 21/00**
**U.S. Cl. 24—263FC** **2 Claims**

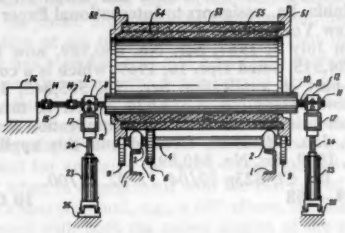


A clamping device for clamping a towel or the like flexible material and comprising an endless body, preferably parabolic-shaped, defining an open space therewithin and an elongated member extending transversely of said body across the space defined therewithin and having elongated slots in opposite end portions thereof through which opposed portions of said body extend, the distance between the proximate ends of the elongated slots being less than the distance between the opposed portions of the endless body, whereby the elongated member is slidable relative to the endless body.

**3,585,694**
**MANUFACTURE OF CONCRETE PIPES**
**Clifford Aubrey Baker, 4 Solway Drive, Glen Waverley, Victoria, Australia, and Morris Charles Kiefel, 19 Longbourne Ave., North Clayton, Victoria, Australia**
**Continuation-in-part of abandoned application Ser. No. 567,272, July 22, 1966. This application Mar. 14, 1969, Ser. No. 807,191**
**Claims priority, application Australia, July 27, 1965, 61,968/65**
**Int. Cl. B28b 21/24**
**U.S. Cl. 25—30C** **8 Claims**

In an apparatus for manufacturing reinforced concrete pipe, the improvement whereby the retarding tangential force exerted between the compacting roller and the pipe

is substantially overcome. The means for overcoming the retarding force includes motor means operatively connected to drive the compacting roller and motor means operatively and controllably connected to drive the pipe.



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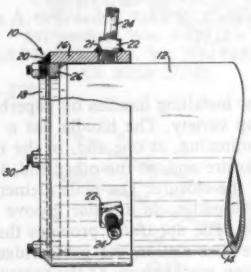
**3,585,695**
**ADJUSTABLE PIPE END MOLD**
**Robert D. Penny, Crane, and Dick Yates, Midland, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.**
**Filed Feb. 25, 1969, Ser. No. 802,173**
**Int. Cl. B28b *21/80***
**U.S. Cl. 25—38** **6 Claims**



A device for molding the end of a cast cement pipe lining comprising a sleeve that fits snugly over the pipe end and which carries bolts to urge the pipe into round within the sleeve. A keeper ring within the sleeve bears against the pipe end face to accommodate flatness irregularities in the end face and to define the lining thickness. Bolts mounted in an end ring on the sleeve urge the keeper ring tightly against the pipe end face.

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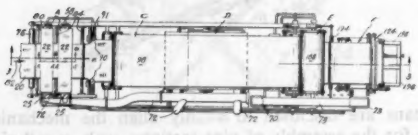
**3,585,696**
**APPARATUS FOR STABILIZING KNITTED TUBULAR FABRICS**
**Edward I. Aronoff, 605 Dorais St., St. Laurent, Quebec, Canada**
**Original application May 22, 1967, Ser. No. 640,317, now Patent No. 3,484,949, dated Dec. 23, 1969. Divided and this application Nov. 3, 1969, Ser. No. 873,616**
**Int. Cl. D06c *5/00***
**U.S. Cl. 26—18.5** **7 Claims**



An apparatus for fixing tubular fabrics including a steam box through which the tubular fabric is passed for moistening the fabric, a floating stretcher on which the tubular fabric is passed after it comes out of the steam box for stretching the fabric laterally, a pair of cooperating blankets passing over rolls adapted to receive the fabric as it comes off the floating stretcher so as to carry the tubular fabric with a minimum of lateral and longitudinal tension, passing the fabric between the blankets through a further steam chamber which includes a perforated convexly curved wall opposite an enclosed suction chamber having a concavely curved wall for fixing the fabric and heating means for drying the fabric as it is delivered from the cooperating blankets.

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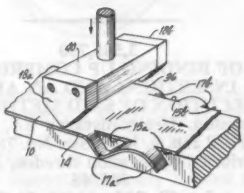
**3,585,697**
**PROCESS FOR FORMING APERTURES IN DUCTILE STRIPS**
**Warwick W. Butler, 28 M. Rivera Ferrer, San Patricio, Caparra Heights, Puerto Rico 00920**
**Filed July 28, 1969, Ser. No. 845,434**
**Int. Cl. B21d *31/04***
**U.S. Cl. 29—6.2** **15 Claims**



In procedure for forming a row of apertures along an edge of a metal strip, a row of slits is cut in the strip in adjacent parallel relation to the strip edge, and as each slit is cut, a strand portion of the strip between the slit and the strip edge is stretched in a direction transverse to the major surface planes of the strip. Thereafter the strand portions are flattened and deformed outwardly in the major surface planes of the strip so as to open the slits in the major surface planes.

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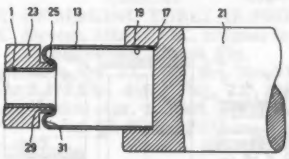
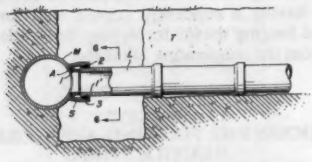
**3,585,698**
**METHOD OF MANUFACTURING A TELESCOPIC TUBE**
**Wilhelm Kamper, Wetzlar, Germany, assignor to U.S. Philips Corporation, New York, N.Y.**
**Filed June 4, 1969, Ser. No. 830,432**
**Int. Cl. B23p *17/00, 13/00***
**U.S. Cl. 29—155C** **3 Claims**



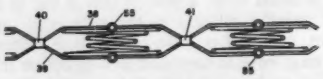
A method of manufacturing a telescopic tube for particular use as a telescopic aerial, having intermediate springs at its lower end which establish a resilient engagement and electrical contact between the segments of the tube comprising the steps of widening one end of the tube, forming an annular groove at the transition between the widened and unwidened portions of the tube in the direction toward the widened end and finally forcing the widened portion inside out over the unwidened tube from the annular groove onwards. Slots may finally be formed in the turned up portion.

3,585,699
**METHOD OF CONNECTING SUBTERRANEAN PIPE LINES**
Eugene E. Shuttle, 315 Sylvania Ave., Glenside, Pa. 19038
Filed May 12, 1969, Ser. No. 823,921
Int. Cl. B21d *53/00*; B21k *29/00*; B23p *15/26*
U.S. Cl. 29—157 3 Claims



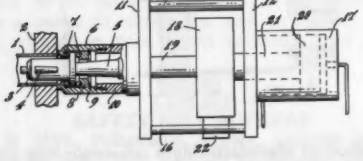
The invention is directed to a novel method for extending an existing pipe line such as an underground sewer or the like by connecting to it a lateral or branch line without interfering with the continuous availability for service of the existing line

3,585,700
**METHOD OF BINDING UP COMPRESSED ELASTIC SPRING INSERTIONS AND AN ARRANGEMENT FOR EXECUTION OF SAID METHOD**
John G. Jansson, Hemgordsvagen 6A, Kolsva, Sweden
Filed Jan. 8, 1969, Ser. No. 789,913
Claims priority, application Sweden, Jan. 17, 1968, 585/68
Int. Cl. B23p *13/00, 19/00*
U.S. Cl. 29—173 8 Claims



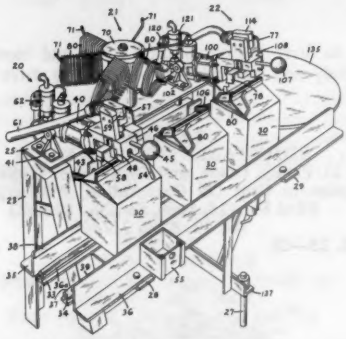
The method provides for compressing a set of elastic springs, followed by placing two strings respectively on opposite sides of the springs and then stapling the springs together at various points thereon. The apparatus provides means for accomplishing these steps.

3,585,701
**APPARATUS FOR EXPANDING TUBES**
Walter E. Stary, P.O. Box 578, Levittown, Pa. 19058
Filed Jan. 27, 1969, Ser. No. 804,041
Int. Cl. B23p *15/26*
U.S. Cl. 29—202 12 Claims



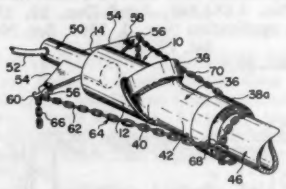
This invention provides apparatus to ascertain that the selected degree of interference fit is being produced as each end portion of each tube is expanded into its tube-hole in its mating tube-sheet. The apparatus senses and checks the work-producing force at selected moments during each work cycle, and if any force checked is not the proper magnitude said apparatus indicates a defective work-cycle has been produced.

3,585,702
**APPARATUS FOR APPLYING HANDLES TO CONTAINERS**
Frank R. Linda, Fairfield, Conn., and Leigh D. Leiter, Philadelphia, Pa., assignors to International Paper Company, New York, N.Y.
Application July 3, 1967, Ser. No. 650,989, now Patent No. 3,484,515, dated Dec. 16, 1969, which is a continuation-in-part of application Ser. No. 565,045, July 6, 1966, now Patent No. 3,373,924, which in turn is a continuation-in-part of abandoned application Ser. No. 521,362, Jan. 18, 1966. Divided and this application May 26, 1969, Ser. No. 840,891
Int. Cl. B23p *19/04, 11/02, 11/00*
U.S. Cl. 29—208 10 Claims



Apparatus for installing handles on paperboard cartons of the gable top variety. The handle has a unitary loop of material terminating, at one end, in the male element of a snap fit closure and, at the other end, in the female eye element of the closure. The male element has a conical surface, a shoulder, an annular groove and a cylindrical stud body. The apparatus provides three operating stations. At the first station the gable ridge is punched by a power-driven mechanism. At the second station, the male member of the fastening portion of the handle is inserted through the punched hole. At the third station, there is provided a power-driven mechanism for automatically establishing the snap fit or lock of the male and female fastening portions of the handle and in a continuing operation heading the protruding end of the male portion to provide a positive and permanent lock of the handle to the carton.

3,585,703
**TOOL FOR JOINING SOIL PIPE**
Thomas J. Goss, 1757 W. Lunt Ave., Chicago, Ill. 60626
Filed Apr. 7, 1969, Ser. No. 814,142
Int. Cl. B23p *19/04*
U.S. Cl. 29—237 10 Claims



Means are disclosed to axially align the mechanical force for the assembly of pipe sections, such as soil pipe, whereby the bell and spigot ends are forced together and moved in concentric orientation during the formation of a pipe joint. An adapter or shoe is disclosed to engage the

curved part or heel of the bell end of a pipe section, including a seat for the engagement of a work means, whereby the axis of the work means, the major axis of the pipe spigot section and the axis of the bell section to which it is to be joined are maintained in a substantially in-line orientation at all times. In one embodiment the adapter or shoe has a central seat and a notched, recessed or contoured end to engage the outer lip and heel of an elbow, the seat being axially oriented with the remaining straight section of the spigot end of the elbow. In another embodiment the adapter is of a larger diameter than the pipe and has a seat for engaging the work means located off-center so that when in engagement with the bell end of an elbow having a sharper bend, e.g., a 60° elbow, the seat is axially oriented with both the spigot section of the elbow and the bell end of the pipe section to be joined therewith. In still another embodiment the adapter has a truncated end to fit the heel of a 90° elbow with an adjustable hook to engage the top edge of the bell and maintain in-line orientation of the work means. For the assembly of two straight pipe sections the adapter is provided in the form of a plate affixed to the seat at a right angle to the axis of the pipe section. A combined universal tool having shoes to fit two or more different elbow bends is also disclosed.

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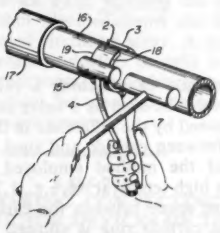
**3,585,704**
**CLAMPING DEVICE**
**John A. Schroeder, 7124 W. Center St., Milwaukee, Wis. 53210**
**Filed May 19, 1969, Ser. No. 825,730**
**Int. Cl. B25b *27/02***
**U.S. Cl. 29—275** **3 Claims**




A tool of the pliers or wrench type which is provided with a pair of opposed semi-circular jaws and a striking head mounted adjacent to the jaws for receiving blows delivered by a hammer or mallet to cause a tail pipe gripped by the jaws to be inserted into a muffler.

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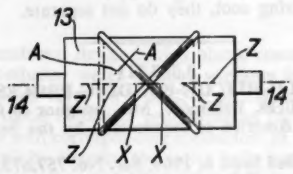
**3,585,705**
**METHOD OF FORMING LIGHT GUIDES**
**William B. Allan, Leeds, England, assignor to The Rank Organisation Limited, London, England**
**Filed Feb. 24, 1969, Ser. No. 801,269**
**Claims priority, application Great Britain, Feb. 28, 1968, 9,585/68**
**Int. Cl. B23p *17/00***
**U.S. Cl. 29—412** **10 Claims**




The manufacture of light guides wherein a continuous filament is wound onto a former whilst there is relative movement axially of the former of a filament guide means to form an endless bundle of filament loops which is severed appropriately to produce the required light guide.

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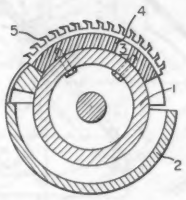
**3,585,706**
**METHOD OF MANUFACTURING A COMBING CYLINDER FOR A COMBING MACHINE**
**Akira Moriwaki, Ikeda-shi, Japan, assignor to Nitto Shoji Kabushiki Kaisha, Osaka, Japan**
**Original application June 21, 1966, Ser. No. 559,186, now Patent No. 3,419,941, dated Jan. 7, 1969. Divided and this application Apr. 29, 1968, Ser. No. 724,944**
**Int. Cl. B23p *17/00***
**U.S. Cl. 29—423** **4 Claims**




A method of manufacturing a combing cylinder for a combing machine in which a plurality of bands, each having a segment of its periphery provided with teeth for combing textile fibers, are arranged axially on a temporary carrier or support, releasably bonded together in relative positions, and then removed from the carrier or support. The bonding material then acts as a carrier or support and holds the bands in assembly while the toothed segments are removed therefrom and assembled on a cylindrical member, and jointly defining therewith a complete combing cylinder. The bands may be developed by winding a wire having peripheral teeth on a core carrier or support and then applying a bonding agent such as a resin or a solder to the bands to hold them in their relative positions. The toothed segment of each band is removed from the remainder thereof and then assembled into the complete combing cylinder. The bands may be individual rings assembled axially to form an elongated toothed segment which is removed from the rings. Prior to removal of the toothed segment, the rings are bonded together by a resin or metallic alloy solder and then the segment, or several similar segments, are joined with another elongated segment free of teeth in fixed relative positions, thereby defining a complete combing cylinder.

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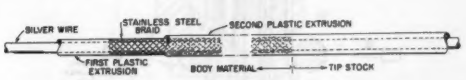
**3,585,707**
**METHOD OF MAKING TUBULAR PRODUCTS**
**Robert C. Stevens, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.**
**Original application Apr. 13, 1966, Ser. No. 542,265, now Patent No. 3,485,234, dated Dec. 23, 1969. Divided and this application Apr. 1, 1969, Ser. No. 833,228**
**Int. Cl. B23p *19/02***
**U.S. Cl. 29—427** **1 Claim**



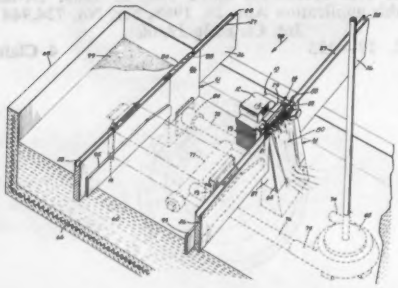

Plastic tubing of accurately controlled bore size is made by extruding the plastic onto a ductile wire core, and thereafter stretching the core to reduce its diameter and facilitate its removal. The core also serves to support the plastic tube wall during application of a braided wire layer.

3,585,708

## METHOD AND APPARATUS FOR SOLDERING ELECTRICAL LEADS TO TERMINALS ON A CORE AND COIL ASSEMBLY

Robert H. Parsons, Danville, Ill., assignor to General Electric Company

Continuation of application Ser. No. 612,517, Jan. 30, 1967. This application Dec. 5, 1969, Ser. No. 878,974
Int. Cl. B23k 31/02
U.S. Cl. 29—471.3 6 Claims



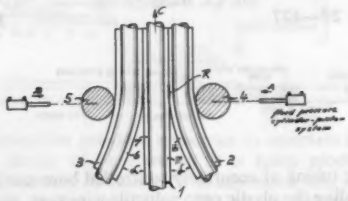
A method and apparatus for soldering electrical leads to terminals of a magnetic core and coil assembly. The method includes the step of moving a core and coil assembly past a flow of solder to solder the leads and terminals. Predetermined lengths of leads are positioned adjacent to terminal pads on the assembly. With the leads held in place, the terminals and leads are wetted as at least the ends of the leads traverse the crest of a cascade of solder. The direction of the solder flow is controlled so that solder will not contact the core and coil. In the apparatus, a rail of a conveyor both supports the terminal pads and gauges the length of lead inserted in the terminals. The conveyor includes a trough along which the free ends of the leads may slide. The conveyor moves the assembly along a solder emitting orifice. As the terminals traverse the orifice at least the ends of the leads contact the flow of solder to wet the ends of the leads and adjacent portions of the terminals with molten solder.

3,585,709

## METHOD OF MAKING TUBULAR WALLS FROM FINNED PIPES

Werner Müller and Werner Oehler, Gummersbach, Germany, assignors to L. & C. Steinmuller G.m.b.H., Gummersbach, Germany

Filed July 30, 1968, Ser. No. 748,788
Claims priority, application Germany, Aug. 4, 1967, St 27,212
Int. Cl. B23k 31/02
U.S. Cl. 29—472.3 3 Claims



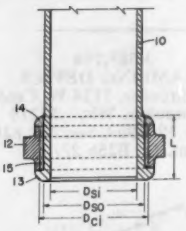
A method and apparatus for producing a gas-tight pipe wall according to which lateral pipe means with longitudinally extending oppositely located fins are fed from opposite outer sides of central pipe means provided with longitudinally extending and oppositely located fins so that the respective adjacent fins of said central and lateral pipe means engage each other first at an acute angle and while being pressed against each other are resistance-welded together along respective adjacent fins thereof. The welded together sections of the lateral and central pipe means are, following the welding step advance and subsequent fin sections of the lateral pipe means are moved toward and onto the central pipe means for likewise welding the same together.

3,585,710

## METHOD OF ATTACHING A CARBIDE RING TO A STEEL TUBE

Lawrence B. Wilder and Renic P. Vincent, Tulsa, Okla., assignors to Pan American Petroleum Corporation, Tulsa, Okla.

Filed Dec. 30, 1968, Ser. No. 787,909
Int. Cl. B23k 31/02
U.S. Cl. 29—473.1 5 Claims




This is a method of attaching a carbide ring to the outside of a steel tube such as a valve stem. It overcomes the problem caused by the difference in thermal coefficient of expansion between carbide and steel. In the preferred embodiment of the method employed, molten brazing compound at a high temperature, e.g., 1,700° F., is melted in the clearance space between the carbide ring and the steel tube. The carbide ring is allowed to cool to about 1,000° F. while the steel tube is kept hot to about 1,500° F. by applying heat to the inside. A steel plug is then placed inside the steel tube adjacent the carbide ring. This steel plug has been sized to have a diameter, at room temperature, equal to that of the inside of the steel tube in its expanded position at 1,000° F. After the plug is inserted, heat is no longer applied and the carbide ring continues to shrink and to displace the excess semi-molten brazing compound. The steel tube also starts contracting until it contacts the plug. The plug which was put into the tube at room temperature, e.g., 80° F., has heat transferred to it from the steel tube and the plug itself starts to increase in size. The steel tube when it contacts the plug will be at least at 1,000° F. and is soft enough to yield easily. As the temperature of the steel plug increases, it continues to expand and causes additional yielding of the steel tube which yields sufficiently so that when it and the carbide ring cool, they do not separate.

3,585,711

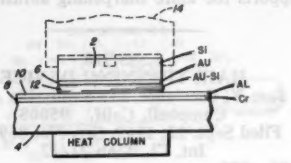
## GOLD-SILICON BONDING PROCESS

Robert E. Hicks, Baltimore, Md., assignor to the United States of America as represented by the Secretary of the Navy

Filed Sept. 6, 1968, Ser. No. 757,873
Int. Cl. B23k 31/02
U.S. Cl. 29—492 4 Claims

A process is disclosed whereby bonding of a semiconductor chip to an aluminum-coated substrate is effected

in the presence of chromium. The present method contemplates using aluminum and gold silicon as the bonding




agent with the chromium acting as a catalyst in the presence of heat and pressure for facilitating a good bond.

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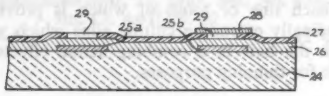
**3,585,712**
**SELECTION AND INTERCONNECTION OF DEVICES ON A MULTIDEVICE WAFER**
**Richard J. Boncuk, Wilmington, Calif., assignor to TRW Semiconductors, Inc., Lawndale, Calif.**
**Filed Dec. 12, 1968, Ser. No. 783,355**
**Int. Cl. B01j *17/00*; H01l *7/00***
**U.S. Cl. 29—574** **17 Claims**




A method of testing and selecting semiconductor devices on a multidevice wafer whereby the devices having characteristics within specified limits are interconnected to form an integrated circuit or array. A mask indicating the position of defective devices or cells is utilized with conventional photolithographic techniques to provide a pattern for connections between only those devices meeting the specified requirements.

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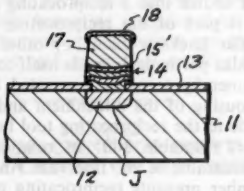
**3,585,713**
**METHOD OF MAKING CONNECTING PARTS OF SEMICONDUCTOR DEVICES OR THE LIKE**
**Yoshiyuki Kaneda, Sakan Iwashita, and Shinichi Hishikawa, Kanagawa-ken, Japan, assignors to Sony Corporation, Tokyo, Japan**
**Filed Mar. 24, 1969, Ser. No. 809,741**
**Claims priority, application Japan, Mar. 25, 1968, 43/19,254**
**Int. Cl. B01j *17/00*; H01l *5/00***
**U.S. Cl. 29—578** **7 Claims**




A semiconductor device having ohmic contacts applied to a semiconductor wafer through windows in a glass or other insulating layer on a surface of the wafer is provided with metal bumps or protuberances for connecting the contacts with corresponding conductors of a header or printed circuit by covering the entire wafer surface with a layer of tin or other metal having no affinity for the insulating layer and strong affinity for the contacts, selectively depositing on regions of the tin layer which correspond to at least portions of the contacts metal, such as lead or an alloy thereof, for forming the desired protuberances or bumps and for which the tin layer has a strong affinity, and then heating the resulting structure so that the tin layer is aggregated on the ohmic contacts as a result of its surface tension and causes a corresponding aggregation of the bump or protuberance forming metal.

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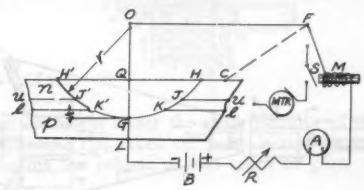
**3,585,714**
**METHOD FOR MAKING SOLID-STATE DEVICES**
**Chou H. Li, 379 Elm Drive, Roslyn, N.Y. 11576**
**Continuation-in-part of application Ser. No. 490,955, Sept. 28, 1965, now Patent No. 3,430,109. This application Sept. 23, 1968, Ser. No. 761,646**
**Int. Cl. B01j *17/00*; H01l *5/00***
**U.S. Cl. 29—580** **25 Claims**




This disclosure discloses a novel method for making new and/or improved solid-state devices which comprises surface-contouring the device junction or active region whereby the resultant peripheral surface of this region is differentially, and often greatly, expanded into a desired geometrical shape or surface contour shape, such as a cylindrically or elliptically concave surface, another surface of revolution or, in general, a surface of oriented arcuate cross-section. This invention also describes methods that are particularly useful in connection with the surface-contouring operation, for precision solid-state material shaping, selective defective material removal, novel doping results, improved device mountings, and simple but reliable electrical interconnections.

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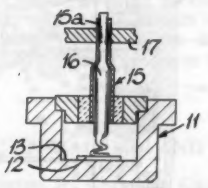
**3,585,715**
**METHOD OF SEALING SEMI-CONDUCTOR ASSEMBLIES**
**Brian Bedford, Sutton Coldfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England**
**Filed Sept. 11, 1968, Ser. No. 758,987**
**Claims priority, application Great Britain, Sept. 18, 1967, 42,367/67**
**Int. Cl. B01j *17/00*; H01l *1/10***
**U.S. Cl. 29—588** **1 Claim**




A method of sealing a semi-conductor assembly of the kind including a cup-shaped housing, a semi-conductor device within the housing, a closure member closing the housing, a metal sleeve extending from said closure member, and a lead electrically connected at one end to said semi-conductor device and extending from the housing

within the sleeve, comprises the steps of flattening a part of the sleeve remote from the housing so that the wire lead is also flattened. The flattened part of the sleeve is then subject to pressure while an electric current is passed therethrough, the electric current causing the portion of the lead within the flattened part of the sleeve to become welded to the sleeve, and thereby form a seal within the sleeve between the interior of the housing and atmosphere.

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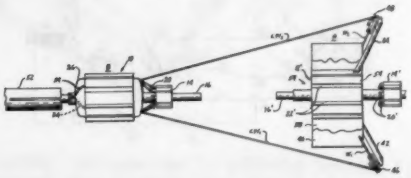
**3,585,716**
**METHOD OF AUTOMATICALLY WINDING ARMATURES**
**Otto F. Steinke, Dayton, Ohio, assignor to The Globe Tool and Engineering Company, Dayton, Ohio**
**Filed Aug. 1, 1968, Ser. No. 749,381**
**Int. Cl. H01r** *43/00*
**U.S. Cl. 29—597** **3 Claims**



In the automatic winding of successive armatures by double flier winding machines, wasted wire is minimized and the subsequent handling of the wound armatures is simplified by cutting out sections of the wires connected between wound and unwound armatures and closely adjacent the two armatures. The cutter assembly cuts both connecting wires in two places simultaneously, the wires being moved into the operative path of the cutter mechanisms by rotation of the fliers.

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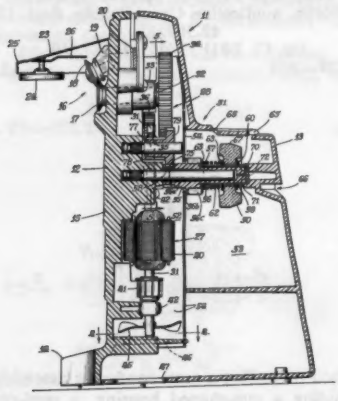
**3,585,717**
**COMBINATION CAN OPENING AND KNIFE SHARPENING APPLIANCE**
**Sigmund H. Bielak, Downers Grove, and Stanton A. Johnson, Homewood, Ill., assignors to Sunbeam Corporation, Chicago, Ill.**
**Filed Apr. 8, 1968, Ser. No. 719,635**
**Int. Cl. B67b** *7/38*
**U.S. Cl. 30—4** **8 Claims**



A combination can opening and knife sharpening appliance utilizing an integral plastic frame member for supporting an electric motor as well as the can opening and knife sharpening mechanism. A cover member cooperating with the plastic supporting frame to form a housing enclosure with a thrust bearing for the shaft which supports the knife sharpening abrasive wheel.

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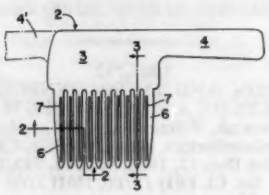
**3,585,718**
**HAIR THINNING DEVICE**
**Jose V. Escalante, 213 Sunnyside Ave., Campbell, Calif. 95008**
**Filed Sept. 22, 1969, Ser. No. 859,841**
**Int. Cl. B26b** *21/12*
**U.S. Cl. 30—123** **8 Claims**



Presented is a hair thinning device in the nature of a comb each tine or tooth of which is provided with a longitudinally extending cutting edge which when drawn through the hair in a combing action effects cutting of the hair for thinning purposes.

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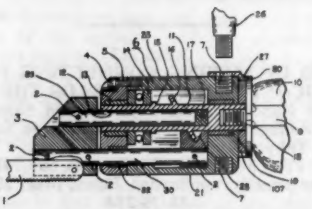
**3,585,719**
**POWER TOOLS**
**Stanley Edward Kivela, Rte. 1, Box 94, Marengo, Wis. 54855**
**Filed Oct. 19, 1967, Ser. No. 676,597**
**Int. Cl. B26b** *19/02*
**U.S. Cl. 30—166** **9 Claims**



An attachment for power tools that have rotating powers shafts. The attachment converts the rotary motion of the power source into a reciprocating action. The tool holder that is part of the reciprocating component can hold a regular hacksaw blade or other cutting blades. This design also particularly lends itself to conversion into a grass trimmer by securing a serrated bed plate to the stationary housing of the attachment and a reciprocating serrated blade to the reciprocating tool holder. The entire attachment is rotatable 360° in relation to the power source and securable at 90° intervals. An "outrigger" stabilizing member prevents reciprocating tool holder from binding when any twisting forces are applied to the power tool.

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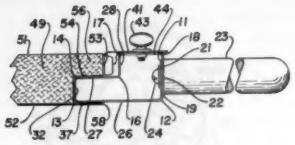
**3,585,720**
**SHIPLAP KNIFE**
**John E. O'Neal, Indianapolis, Ind., assignor of fractional part interest to John J. Cotton, Indianapolis, Ind.**
**Filed Jan. 29, 1969, Ser. No. 795,108**
**Int. Cl. B26b** *29/00*
**U.S. Cl. 30—279** **5 Claims**

Sheet metal strip is formed into a tube of L-shaped cross section, with a handle secured thereto. A channel-

shaped portion of the cross section is sharpened at opposite edges to provide a double-edged, channel-shaped blade.



An adjustable locator is mounted on the tool to facilitate adjustment of the depth of the cut made by the tool.

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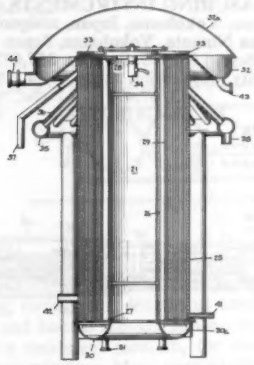
**3,585,721**
**APPARATUS FOR THE PRODUCTION OF COTTAGE CHEESE**

**Alden Harvey Wakeman, Lake Mills, and Dan Crabill Roahen and Rodney Lee Knox, Fort Atkinson, Wis., assignors to St. Regis Paper Company, New York, N.Y.**

**Original application July 13, 1966, Ser. No. 564,951, now Patent No. 3,465,439, dated Sept. 9, 1969. Divided and this application Mar. 25, 1969, Ser. No. 832,520**
**Int. Cl. A01j *25/00***
**U.S. Cl. 31—46** **11 Claims**



A device for processing milk products in a continuous manner for the production of cheese and comprising a large surface heat exchanger through which the milk products pass while becoming coagulated at a particular acidity; and further comprising cutting means for cutting the emerging curd and means for treating the curd to produce cheese.

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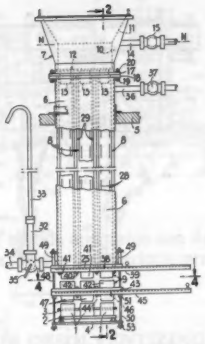
**3,585,722**
**PROCESS AND MACHINE FOR CONTINUOUSLY MOULDING CHEESE OF THE SOFT PASTE TYPE**

**André Legueux, Bourmont, France, assignor to J. Bongrain et Cie, Illoud, France**

**Filed Feb. 7, 1969, Ser. No. 797,534**
**Claims priority, application France, Feb. 13, 1968, 139,609**
**Int. Cl. A01j *25/13***
**U.S. Cl. 31—89** **7 Claims**

Process and machine for continuously moulding soft cheeses. The process comprises forming and then maintaining in at least one perforated drainage tube a vertical column of soft paste by feeding it continuously at its upper end by means of a hopper. This paste is concentrated by a filtering of a part of the serum and a predetermined height of the concentrated curd and remaining serum is taken off from the base of the column while maintaining



the taken off height under the static pressure of the rest of the column. The taken off paste is transferred to a mould having the volume of said taken off part.

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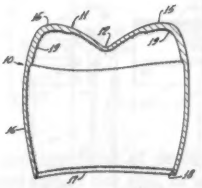
**3,585,723**
**DENTAL CROWN AND METHOD OF INSTALLATION THEREOF**

**George G. Simor, Santa Ana, Calif., assignor to The Ion Company, Costa Mesa, Calif.**

**Filed June 20, 1969, Ser. No. 835,181**
**Int. Cl. A61c *5/08***
**U.S. Cl. 32—12** **34 Claims**



The dental crown of this invention includes an occlusal surface and a sidewall that tapers in cross section toward a restricted opening at the cervix, where there is a rounded inner corner. The central groove at the occlusal surface has sharp convergence and a thin wall at its base, allowing the depth of the groove to be varied, while the cusps of the occlusal surface have a thickened wall. The crown is installed by pushing it onto the prepared tooth to expand the cervix and cause it to become complementary to the cervical end of the tooth. After this, the crown is removed, an excess of cement is introduced into its interior, and it is replaced on the tooth, after which the cervical corner is burnished to form a feather edge where the tooth is engaged.

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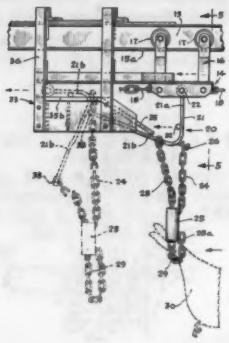
**3,585,724**
**AUTOMATIC UNSHACKLER AND TRANSFER SYSTEM**

**Bert S. Harrington, Jr., Chamblee, Ga., assignor to Chemetron Corporation, Chicago, Ill.**

**Filed Apr. 14, 1969, Ser. No. 816,009**
**Int. Cl. A22b *5/00, 7/00***
**U.S. Cl. 17—24** **12 Claims**

There is provided a self-securing shackle and automatic unshackler and transfer system for transferring carcasses in a slaughterhouse, aligning the carcasses with a desired orientation, and releasing the carcasses at the de-

sired position. The shackle is of the sleeve and chain type wherein moving of a shackle bar past a cam pivots the shackler bar to release the sleeve and chain. Pivoting of



the bar will loosen a loop formed by the chain and sleeve and release a carcass. The carcass will drop at a desired point and with a desired orientation.

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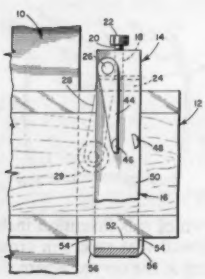
**3,585,725**
**DRAFTING AID**
**James M. Stewart, 2800 N. Flagler Drive, West Palm Beach, Fla. 33407**
**Filed Nov. 4, 1969, Ser. No. 873,977**
**Int. Cl. B43l 7/04**
**U.S. Cl. 33—80** **2 Claims**



The disclosure concerns a drafting aid. Specifically, a holding device for fitting with a T square for the purpose of holding the T square in normal working position, i.e., square to the board. The device includes a spring urged roller interconnected with a bar clamping means which fixes the parts in position on the T square. Normal position maintains the desired board squareness in use, but also allows ready release of the roller without dismounting, whereby the T square with the device thereon may be removed and replaced at will.

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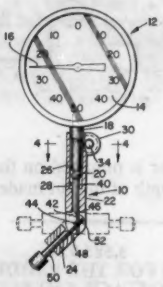
**3,585,726**
**ANGULARLY ADJUSTABLE STEM FOR DIAL INDICATORS AND THE LIKE**
**Harry L. Kotowski, Lexington, Mass., assignor to B. C. Ames Company, Waltham, Mass.**
**Filed Oct. 3, 1969, Ser. No. 863,532**
**Int. Cl. G01b 5/00, 3/22**
**U.S. Cl. 33—148** **8 Claims**

An angularly adjustable stem is provided for use with dial indicators and the like. The stem includes a pair of articulated tubular sections each provided with a driving rod formed with rack teeth in mesh with a pinion gear rotatably mounted in the hinged portion of the tubular sections. One tubular section is fitted to the dial indicator with its rod drivingly engaging the stem of the indicator.



The other tubular section may be set at various angular positions and its rod employed to engage the work. The dial indicator may be positioned at a selected angle about the axis of the stem.

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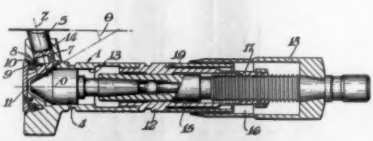
**3,585,727**
**MEASURING INSTRUMENTS**
**Toji Hirose, Yokohama, Japan, assignor to Yehan Numata, Yokohama, Japan**
**Filed Sept. 15, 1969, Ser. No. 857,672**
**Claims priority, application Japan, Sept. 19, 1968, 43/67,470**
**Int. Cl. G01b 5/12**
**U.S. Cl. 33—178** **2 Claims**



An instrument for measuring inside dimensions comprising a cone-shaped motivating head freely movable in a longitudinal direction parallel to the inside surface of an object being measured when the head is positioned inside the object. One end of each of the several bar-shaped feeler members engages an inclined face of the cone-shaped motivating head for movement toward and away from the axis of the motivating head as the head moves in a longitudinal direction relative to the feeler members. Each bar-shaped feeler member has a longitudinal axis perpendicular to the line that bisects the angle formed by the inclined face of the cone-shaped motivating head and the axis of the head.

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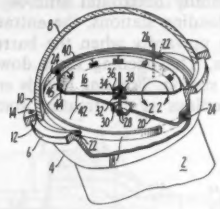
**3,585,728**
**COMPASS CARD WITH MAGNETIC PARTICLES**
**Robert D. Ogg, Portland, Maine, assignor to The Eastern Company**
**Filed June 2, 1969, Ser. No. 829,534**
**Int. Cl. G01c 17/04**
**U.S. Cl. 33—222** **1 Claim**

An improved compass card wherein the magnetic portion of the card is provided in the form of small magnetic particles either in the body of the card as such or as a layer applied over at least one face of the card. The

magnetic particles have a magnetization of substantially the same intensity while their direction of magnetization is at an angle of substantially 20° to the axis of revolution



of the card. A card so constructed is free of the gyrational motion which characterizes cards used heretofore and wherein separate magnets were supported upon the card.

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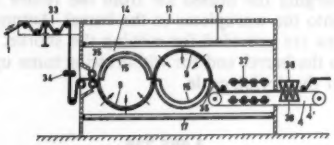
**3,585,729**
**PROCESS AND APPARATUS FOR THE TREATMENT OF LENGTHS OF MATERIALS**
**Heinz Fleissner, Egelsbach, near Frankfurt am Main, Germany, assignor to VEPA AG., Basel, Switzerland**
**Original application July 20, 1967, Ser. No. 654,728, now Patent No. 3,503,134. Divided and this application Apr. 29, 1969, Ser. No. 821,551**
**Int. Cl. F26b *3/06***
**U.S. Cl. 34—12** **15 Claims**



The present disclosure relates to a process and apparatus for the treatment of materials, for example drying, steaming, setting, curing, etc., lengths of textile materials such as woven and knitted fabrics, non-woven, tufteds, and the like, with a treatment medium, for example, air, steam or air/steam mixtures. More particularly, the present disclosure is directed to a process and apparatus for the treatment of materials which comprises conveying a continuous length of material through a treatment chamber on the surface of at least one sieve means subjected to a suction draft, said material being held to said sieve means by said suction draft, and drawing a treatment medium around and through the material being treated, said material being held and guided at the outlet of the apparatus in a stretched condition on tensioning elements after it is removed from the sieve means.

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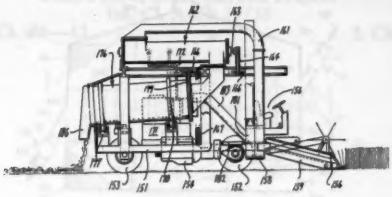
**3,585,730**
**METHOD AND APPARATUS FOR THE PRESERVATION OF NUTRIENTS IN FORAGE**
**George W. Morse, 9673 Melrose Ave., Elk Grove, Calif. 95624**
**Filed Jan. 17, 1969, Ser. No. 792,049**
**Int. Cl. F26b *7/00***
**U.S. Cl. 34—17** **17 Claims**

A method and apparatus for preserving nutrient in hay by rapidly heating freshly cut hay to arrest enzymatic degradation without damage to forage. Forage is exposed to steam, preferably super-heated, for up to five seconds. The apparatus comprises means for feeding forage to a steam treating drum where enzymes are destroyed and a first dryer means for both the mobile and stationary apparatus. In the stationary apparatus, a second dryer means



is used and in the mobile apparatus sun drying is used, to provide dried forage with the nutrients preserved.

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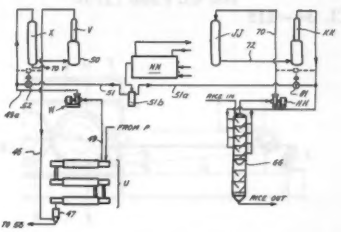
**3,585,731**
**METHOD FOR DESOLVENTIZING SOLVENT EXTRACTED MILLED RICE**
**Truman B. Wayne, P.O. Box 13086, Houston, Tex. 77019**
**Continuation-in-part of application Ser. No. 529,814, Feb. 24, 1966. This application Jan. 4, 1968, Ser. No. 695,632**
**Int. Cl. F26b *3/00***
**U.S. Cl. 34—27** **16 Claims**



A method and apparatus of desolventizing previously solvent extracted milled rice and, in certain embodiments of the invention, desolventizing of the bran removed from the rice. The method and apparatus contemplates using a desolventizing gaseous medium comprising inert gas as the major component thereof wherein the gaseous medium is contacted with the rice when at a temperature in the range from about 100° F. to about 150° F., whereby the solvent is vaporized from the rice at a relatively low temperature, thereby preserving the quality of the rice. The gaseous medium with the vaporized solvent entrained therein is subsequently condensed to remove the solvent therefrom and the medium is subsequently heated and recycled.

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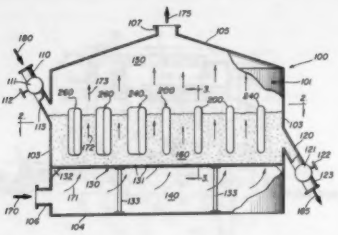
**3,585,732**
**APPARATUS FOR DRYING SOLIDS**
**Tohru Itahashi, Yokohama, Japan, assignor to General American Transportation Corporation, Chicago, Ill.**
**Filed May 12, 1969, Ser. No. 823,653**
**Claims priority, application Japan, May 15, 1968, 43/40,007**
**Int. Cl. F26b *17/10***
**U.S. Cl. 34—57** **14 Claims**

A fluidized bed-dryer with heat-exchange elements in the form of pillow-shaped envelopes having the side dimensions thereof exposed to the flow of particulate matter in the fluidized bed substantially greater than the edge dimension thereof exposed to the upward flow of fluidizing gas in the fluidized bed. The pillow-shaped envelopes

are disposed in the fluidized bed at various angles with respect to the particulate matter flow path to cause the



particulate matter to flow along a sinuous path. The pillow-shaped envelopes may have sinuous sides.

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**3,585,733**

## APPARATUS FOR TREATING TEXTILE MATERIAL

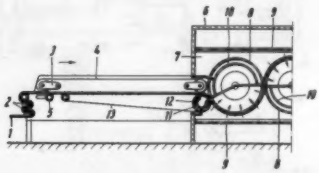
**Heinz Fleissner, Egelsbach, near Frankfurt am Main, Germany, assignor to VEPA AG**

**Application June 9, 1969, Ser. No. 831,686, now Patent No. 3,521,378, dated July 7, 1970, which is a continuation-in-part of application Ser. No. 654,728, July 20, 1967. Divided and this application Nov. 21, 1969, Ser. No. 877,563**

**Claims priority, application Germany, June 8, 1968, P 17 60 604.1; June 22, 1968, P 17 60 717.9; June 27, 1968, P 17 60 751.9; Apr. 8, 1969, P 19 17 757.2; May 9, 1969, P 19 23 668.1**

**Int. Cl. F26b *13/30***

**U.S. Cl. 34—115** **7 Claims**



The present disclosure is directed to an apparatus for the treatment of materials which comprises a heat-insulated treatment chamber, a plurality of sieve drum means subjected to a suction draft rotatably disposed within said treatment chamber, fan means associated with the sieve drum means for producing a suction draft and for circulating the treatment medium in said treatment chamber, heating means provided in the circulation zone of the treatment medium, tentering means containing tensioning chains at least partially disposed outside of the treatment chamber as inlet means, said tentering means cooperating with the sieve drum means for the effective conveyance of the material being treated to said sieve drum means, a supporting means disposed below the tensioning chains for supporting the material disposed on said chains and outlet means for removing the material being treated from the treatment chamber.

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**3,585,734**

## BARREL TYPE PROCESSING APPARATUS

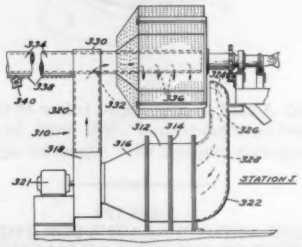
**James Barton, Grosse Pointe Woods, and Patrick H. Norton, Birmingham, Mich., assignors to Ionic International Inc., Lansing, Mich.**

**Original application July 27, 1966, Ser. No. 568,287, now Patent No. 3,521,650, dated July 28, 1970. Divided and this application Oct. 1, 1969, Ser. No. 870,708**

**Int. Cl. F26b *11/02***

**U.S. Cl. 34—126** **7 Claims**

The automatic barrel-type plating and processing equipment is provided with a plurality of traveling tumbling barrels having entrance openings facing outwardly of a frame supporting them. Each barrel is hollow and perforated, being closed at its bottom, and the barrels are mounted on the frame by lift arms having rotatable and nonrotatable housing portions through which a cathodic conductor extends. Thus the lift arm and barrel assembly may have a generally horizontal attitude when at treating, drying and loading stations, the entrance opening of the barrel facing upwardly when the barrel moves from station to station. The opening faces downwardly when at the unloading station. Treating liquids enter the barrels through their openings at the treating stations. The dry-




ing station is provided with a blower and a return duct extending from the blower and having an end with an opening facing the perforated barrel. Heating means are provided in the return duct. An outlet duct extends from the blower and includes a horizontally extending and movable snorkel which is adapted to be moved through the entrance opening into the interior of the barrel when the latter is at the drying station in an operative position for discharging the heated air from the return duct and blower onto the workpieces in the barrel. Automatic control means are provided for moving the snorkel horizontally into the barrel and for withdrawing same upon completion of the drying cycle.

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**3,585,735**

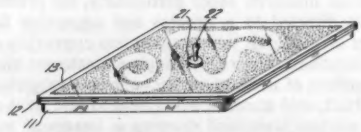
## MAGNETIC TRACING BOX

**Sidney Miller, 1098 E. 58th St., Brooklyn, N.Y. 11234**

**Filed Aug. 27, 1968, Ser. No. 755,581**

**Int. Cl. B43l *1/00***

**U.S. Cl. 35—66** **6 Claims**



A tracing box having a transparent surface, pulverulent material adapted to adhere to the surface of the box when the box is turned upside down and magnetically attractive means within the box operated by a magnet from without the box whereby the magnetically attractive means removes from its path the pulverulent material adhering to the surface of the box to form lines which are visible from the outside of the box and which may be wiped out by shaking the box upside down.

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**3,585,736**

## HEATED BOOTS AND SHOES

**Jeffery R. Polichena, 5450 Powdermill Road Kent, Ohio 44240**

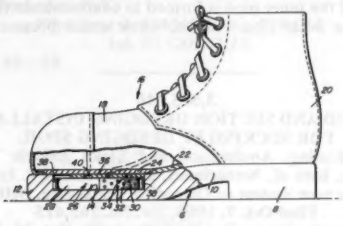
**Filed Apr. 24, 1970, Ser. No. 31,572**

**Int. Cl. A43b *7/02***

**U.S. Cl. 36—2.6** **8 Claims**

A self-contained heat generating and radiating foot warmer for use in a shoe or boot which has a relatively

thick outsole. An upper enclosed surface of the sole is formed with an upwardly opening cavity providing a receiving pocket for said foot warmer. The foot warmer comprises a container with a perforated cap similar to a cigarette lighter and which is adapted to contain absorbent cotton or equivalent filler media saturated with regular



ignitible lighter fluid. The warmer is fitted into and removable from the pocket. A trivet-type guard is located in the pocket and has corner legs fitting into the pocket and a perforated plate portion which overlies the foot warmer. It functions to distributively transfer the weight of the wearer's foot directly to the bottom of the pocket and prevents the foot warmer from being crushed.

**3,585,737**

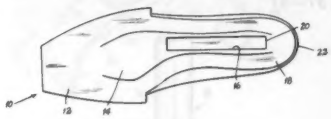
## MOLDED INSOLE

**Francis M. Gilkerson, 20 Lindworth Drive, St. Louis, Mo. 63124**

**Filed Feb. 3, 1969, Ser. No. 796,119**

**Int. Cl. A43b** *13/38*

**U.S. Cl. 36—43** **2 Claims**



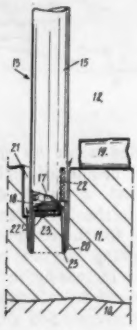
A precast or molded insole for shoes adapted for use with several different heights of high heels comprising a paddle-shaped forepart, a shank depression extending longitudinally from in the heel area forwardly to about midway of the insole for the reception of a metal shank, and the like, after lasting, the heel portion rearwardly of the shank depression increasing in thickness, the insole being suitably contoured for elimination of the use of a filler and to provide streamlined appearance.

3,585,738

## METHOD AND APPARATUS FOR SUCTION DREDGING

Jan De Koning, Amsterdam, Netherlands, assignor to N. V. Ingenieursbureau voor Systemen en Octrooien Spanstaal, Rotterdam, Netherlands

Filed Oct. 7, 1968, Ser. No. 765,416
Claims priority, application Netherlands, Oct. 16, 1967, 67.14007
Int. Cl. E02f *3/92, 3/94*
U.S. Cl. 37—57 11 Claims



The relatively hard layer of clay which covers an underwater body of sand is penetrated rapidly by forcing the lower end of a suction-dredging pipe assembly into the layer while drawing water through the pipe at a sufficiently rapid rate as to erode the clay and form a core of clay in the lower end of the pipe. This core may be removed either by crushing same so that the flowing water rapidly washes it away, or by periodically maintaining suction on the pipe to retain the core, withdrawing the pipe from the hole and expelling the core, whereafter the operation is repeated until the body of sand is reached.

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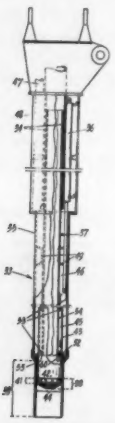
3,585,739

## METHOD AND SUCTION DREDGING INSTALLATION FOR OBTAINING SAND

Jan De Koning, Amsterdam, Netherlands, assignor to N. V. Ingenieursbureau voor Systemen en Octrooien Spanstaal, Rotterdam, Netherlands

Filed Oct. 7, 1968, Ser. No. 765,420
Claims priority, application Netherlands, Oct. 16, 1967, 67.14009
Int. Cl. E02f *3/88, 3/92, 3/94*
U.S. Cl. 37—58 6 Claims



In dredging sand, an inner pipe is movable longitudinally within an outer jacket so that the lower end of the inner pipe may be projected beyond the lower end of the jacket and retracted within the jacket. Suction is maintained on the inner pipe and water under pressure is supplied to the jacket so that, when retracted, the lower end of the inner pipe draws in a mixture of sand and water entering the lower end of the jacket to provide the desired suspension in the pipe. In intermediate positions, the lower end portion of the inner pipe blocks the lower end of the jacket but the lower end portion of the inner pipe is formed to communicate the lower end of the inner pipe with the water under pressure in the jacket.

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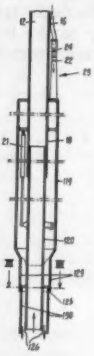
3,585,740

## METHOD AND SUCTION DREDGING INSTALLATION FOR SUCKING UP DREDGING SPOIL

Jan De Koning, Amsterdam, and Tjako Aaldrik Wolters, Utrecht, both of, Netherlands, assignors to N.V. Ingenieursbureau voor System en Octrooien, Rotterdam, Netherlands

Filed Oct. 7, 1968, Ser. No. 765,415
Claims priority, application Netherlands, Oct. 16, 1967, 67.14006
Int. Cl. E02f *3/88, 3/92*
U.S. Cl. 37—63 3 Claims



In dredging sand from an underwater body of sand, the lower end of a suction pipe is inserted into the sand and water under pressure is introduced into the pipe at a level above the lower end of the pipe while suction is maintained at the upper end of the pipe to withdraw a suspension of sand in water having a desired concentration of sand in it which is less than the concentration entering the lower end of the pipe. To lessen the energy required to maintain the suction, the relation between the pressure of the water introduced and the level of its introduction is controlled so that the predetermined concentration of sand exists in the pipe above such level while the level lies well below the top of the body of sand and relatively close to the lower end of the pipe.

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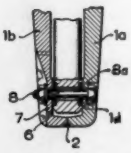
3,585,741

## TOOTH AND GUIDING MEANS THEREFOR FOR EXCAVATING EQUIPMENT

Helmut Heusler, Dortmund-Kirchhorde, Germany, assignor to Orenstein & Koppel Aktiengesellschaft, Berlin, Germany

Filed July 1, 1968, Ser. No. 741,352
Claims priority, application Germany, June 29, 1967, July 29, 1967, P 16 34 917.0; P 16 34 918.1
Int. Cl. E02f *9/28*
U.S. Cl. 37—141 5 Claims



A tool, especially for earth-working implement, in which the tool which has a tooth section and a shank section has its

shank section clamped within a tongue-equipped sleeve by screwbolt means extending through said tongue section and the adjacent shank section.

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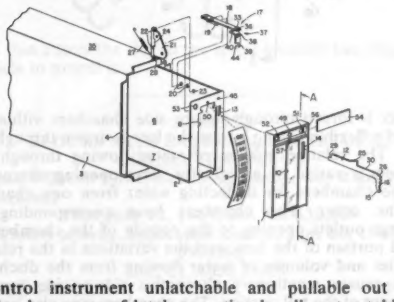
**3,585,742**
**CONTROL INSTRUMENT HOUSING**
**Hugh J. Tyler, Santa Ana, Calif., assignor to Sybron Corporation, Rochester, N.Y.**
**Filed June 2, 1969, Ser. No. 829,674**
**Int. Cl. G09f 3/18**
**U.S. Cl. 40—10** **9 Claims**



Control instrument unlatchable and pullable out of its housing by means of latch-operating handle retractable into front of instrument, and having recess-mounted, removable name plate in front end.

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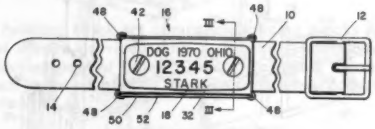
**3,585,743**
**LICENSE TAG AND IDENTIFICATION HOLDER FOR DOG COLLAR**
**Carl H. Jeffers, 1021 W. Main St., Louisville, Ohio**
**Filed Jan. 28, 1970, Ser. No. 6,526**
**Int. Cl. G09f 3/14**
**U.S. Cl. 40—21** **6 Claims**




A holder for a license tag and identifying data such as the owner's name and address which is easily installed on a dog collar without the need for modifying the collar in any way. A pair of U-shaped members are provided, the lower portion of one of these members having its opposite edges bent to form channels into which the lower portion of the other member is slideably received. The upper surface of each of the U-shaped members is provided with a pair of elongated slot spaced a distance equal to the mounting holes of the license tag. A flat rectangular plate fits within the U-shaped members and has a pair of threaded bosses which project upwardly through the slots. Screws are received in these bosses to clamp a license tag to the holder and to clamp the U-shaped members and the flat plate securely together. The screws have pointed lower ends which bite into the leather of the collar to prevent the holder from sliding. The side edges of the U-shaped members may be provided with tabs which are bent to hold printed identifying material.

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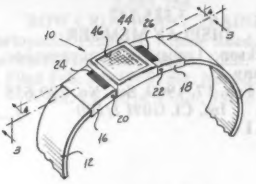
**3,585,744**
**CALENDAR WATCHBAND**
**Michael P. Arnone, North Bergen, N.J., assignor to Kreisler Manufacturing Corporation, North Bergen, N.J.**
**Filed Apr. 14, 1969, Ser. No. 815,945**
**Int. Cl. G09d 3/00, 3/02; G09f 3/14**
**U.S. Cl. 40—21 C** **9 Claims**

A watchband in which an articulated hook and safety catch assembly for joining two ends of watchband halves has a safety catch forming a frame and housing for removably receiving a box carrying a stack or pad of calendar sheets or the like so as to permit the uppermost sheet to be viewed by the person wearing the watch. The safety catch and hook assembly can readily be released without releasing the box. At the same time, when the catch is released, the box is readily removable for replacement of the uppermost sheet. The arrangement is simple, compact, inexpensive and attractive.



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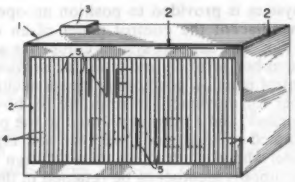
**3,585,745**
**MOTION PICTURE APPARATUS**
**Josep Llobet, 24-15 Twenty-First Ave., Astoria, N.Y. 11105**
**Filed Feb. 12, 1968, Ser. No. 712,318**
**Int. Cl. G09f 11/26**
**U.S. Cl. 40—32** **1 Claim**



This disclosure relates to motion picture apparatus for continuously presenting for viewing a constantly changing composite image presentation. A multiplicity of conveyors, each having a flexible display band carried on a pair of driven drums, are used to convey a plurality of image segments in a coordinated manner to form continuously a composite image presentation. Each drum has a curved surface on which the flexible band is held as it passes through a viewing position and each drum is positively driven by a direct drive arrangement.

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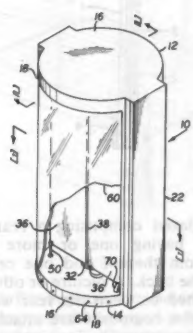
**3,585,746**
**DISPLAY DEVICE**
**Bernard Sterler, 51 Kime Avenue, North Babylon, N.Y. 11703**
**Filed Feb. 27, 1969, Ser. No. 802,968**
**Int. Cl. G09f 11/06**
**U.S. Cl. 40—35** **1 Claim**



The invention is concerned with an advertising display device wherein a plurality of cards are displayed in pairs and

pivotally moved about the common axis of a rotating shaft which is maintained in a stressed condition to prevent reversal in direction and to provide a smooth steady forward motion.

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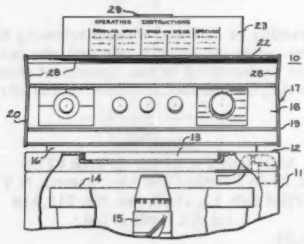
**3,585,747**
**DISPLAY MEMBER**
**Clifford E. Erickson, Louisville, Ky., assignor to General Electric Company**
**Filed Feb. 17, 1969, Ser. No. 799,655**
**Int. Cl. G09f** *1/100*
**U.S. Cl. 40—124.1** **4 Claims**



A support system is provided to position an operating instruction form adjacent the control panel of an automatic washer or the like. The support system comprises an instruction support member pivotally mounted for movement relative to the control panel, a positioning means secured to the support member for movement in response to movement of the support member, and a magnet secured to the positioning means and adapted to slide along the rear and top walls of the control panel whereby attraction therebetween will cause the instruction support member to be retained in the selected position.

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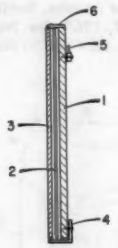
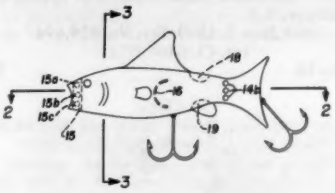
**3,585,748**
**FRAMELESS GLAZED FORMATIONS WITH PLANE SURFACE**
**Rudolf Schneider, and Richard Kastner, both of Munich, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany**
**Filed Nov. 30, 1967, Ser. No. 687,037**
**Claims priority, application Germany, Dec. 6, 1966, W42923**
**Int. Cl. G09f** *1/12*
**U.S. Cl. 40—152** **3 Claims**



A frameless flat glazed comprising a rear wall of chip board, for example having one or more glass support brackets at the bottom thereof and one or more hanger eyelets mounted on the back. A picture or other article to be protected is sandwiched between the rear wall and a glass sheet. The edges of the composite are attached and sealed solely by a room-temperature curing organosiloxane-based elastomeric material which is coated on the edges of the composite.

**3,585,749**
**FLEXIBLE FISHING LURE**
**Edward R. Dieckmann, 5458 Kenridge Drive, Blue Ash, Ohio**
**Filed July 2, 1969, Ser. No. 838,394**
**Int. Cl. A01k** *85/00*
**U.S. Cl. 43—42.03** **8 Claims**



Water is forced through side-by-side chambers within the body of a flexible fishing lure as the lure is drawn through the water. The relative volume of water flowing through the chambers is varied by a deflector valve opening alternately into the chambers for deflecting water from one chamber into the other. The chambers have corresponding jet discharge outlets opening to the outside of the chambers in the tail portion of the lure, and the variations in the relative velocities and volumes of water flowing from the discharge outlets causes reactionary alternative side-to-side bending movement of the tail portion. The chambers may also be provided with pockets of water absorbent material for increasing the weight of the lure before casting for easier casting and sinking upon striking the water.

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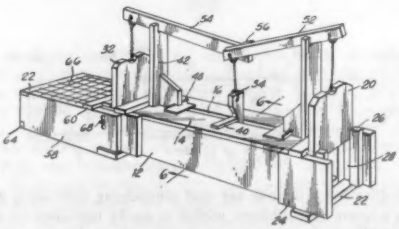
**3,585,750**
**ANIMAL TRAP**
**Henry Arthur Routt, Dondas, Ill. 62425**
**Filed Mar. 27, 1969, Ser. No. 810,984**
**Int. Cl. A01m** *23/20*
**U.S. Cl. 43—61** **1 Claim**



A hollow housing has an elongated slot in the top wall and is provided with a sliding door at each end. A notched support is detachably mounted on the top wall adjacent each door. A lever is pivotally mounted on each support and each lever is connected adjacent one end thereof to a door. One of the levers has an inverted hook for engaging the other lever and a notched trigger. The trigger extends through the elongated slot and is releasably held in position by the engagement of the notch therein with a bar projecting partially across the slot. A burrow enclosure extends from one end of the housing.

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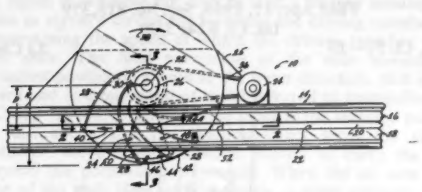
**3,585,751**
**MOVING APPARATUS FOR VEHICLE TOY-IV**
**Janos Beny, Manhattan Beach; Thomas E. See, Huntington Beach, and Arthur S. Woodward, Sylmar, all of, Calif., assignors to Mattel Inc., Hawthorne, Calif.**
**Division of Ser. No. 781,374, Dec. 5, 1968, Pat. No. 3,562,949.**
**Filed July 23, 1970, Ser. No. 57,516**
**1970, Ser. No. 57,516**
**Int. Cl. A63h** *33/00*
**U.S. Cl. 46—1** **6 Claims**

Apparatus for propelling an unpowered toy vehicle so it can then coast around a track, comprising a track section

with slot therein and a rotating spiral member for sweeping along the slot at every revolution. The vehicle has a projection that enters the slot so the spiral member can engage the vehicle to propel it.



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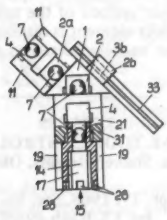
**3,585,752**
**BLOCKS WITH LATERALLY APERTURED CONNECTING PLUGS**

**August Wilhelm Howe, Gottelmannstrasse 42, Mainz (Rhine), Germany**

**Filed June 12, 1969, Ser. No. 832,606**
**Claims priority, application Austria, June 20, 1968, A 5931/68**
**Int. Cl. A63h** *33/08*
**U.S. Cl. 46—25** **13 Claims**



A building block set comprises building blocks having internal spaces provided with an opening laterally receiving connection pegs of other blocks, there being a coupling pin in each space adapted to fit into a transverse recess in the associated peg.

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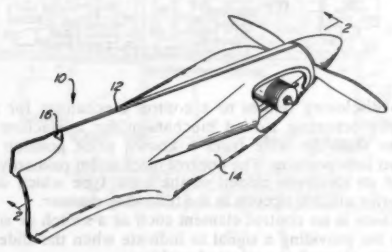
**3,585,753**
**FUSELAGE CONSTRUCTION FOR MODEL AIRCRAFT**

**Leonard R. Purdy, Oakwood, Ga., assignor to Lanier Industries, Inc., Oakwood, Ga.**

**Filed Apr. 29, 1970, Ser. No. 32,800**
**Int. Cl. A63h** *27/02*
**U.S. Cl. 46—76 R** **7 Claims**



A fuselage construction for model aircraft is disclosed, wherein a fuselage is formed by a pair of preformed sheet plastic fuselage shells, edge portions of the shells being coupled together by preformed strip members. The preformed strip members also provide channels for receiving and retaining edges of an internal keel member, the keel member providing an engine mount.

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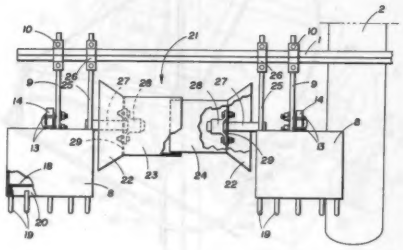
**3,585,754**
**ROW CROP PLANT TRAINER**

**Dean A. Cortopassi, 11292 N. Alpine Road, Stockton, Calif., and Frederick L. Hill, San Joaquin, Calif.**

**Filed Feb. 24, 1969, Ser. No. 801,625**
**Int. Cl. A01d** *45/00, 39/28*
**U.S. Cl. 47—1** **4 Claims**



A machine—for advance along a row crop on a longitudinal soil bed having irrigation furrows at the sides thereof—operative, through the medium of transversely spaced, vertical-axis, ground-driven drums having circumferentially spaced pegs depending from the lower end thereof, and a horizontal flared-end plant-driven top roller spanning between such drums, to engage runners growing into the furrows from plants on the soil bed and to then sweep such runners onto the bed and press-tuck them into the mat of plants thereon, while at the same time compacting such mat in its entirety.

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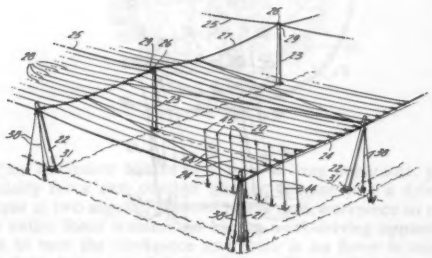
**3,585,755**
**WIRE NETWORK FOR HOP-GROWING FIELDS**

**Robert Albert Thomas, Kortrijk, Belgium, assignor to Trefileries Leon Bedaert, PVBA, Zwevegum, Belgium**

**Filed Nov. 19, 1968, Ser. No. 776,888**
**Claims priority, application Belgium, Nov. 23, 1967, 706 940**
**Int. Cl. A01g** *9/12*
**U.S. Cl. 47—45** **4 Claims**



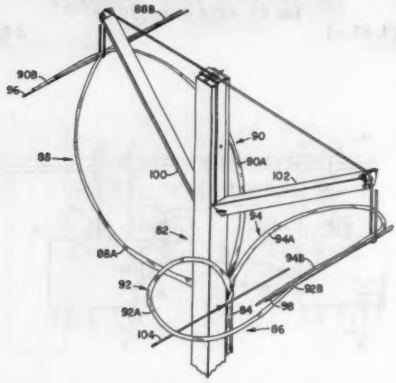
A framework for hop-growing fields consisting of a steel cable network supported by hinged poles on the corners and at intermediate locations. The network supports the overhead wire lines from which the vertical climbing wires for the hop vines are suspended.

3,585,756

## METHOD OF TRAINING VINES

Wallace J. S. Johnson, Berkeley, Calif., assignor to Up-Right, Inc., Berkeley, Calif.

Filed June 16, 1969, Ser. No. 833,290
Int. Cl. A01g 17/02
U.S. Cl. 47—58 5 Claims




A fruit-bearing cordon growing from a trunk of a vine is trained horizontally while young along a wire. After sufficient maturing, the cordon is bent adjacent the trunk into a semicircle, outwardly and upwardly from the trunk, and the end portion of the cordon is trained horizontally in the opposite direction along a higher wire. Such bent or curved portion of the cordon allows the cordon to be shaken vertically and/or horizontally for mechanical harvesting of the fruit growing therefrom.

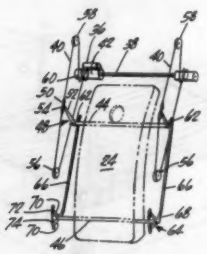
When this cordon is to be replaced, a new cane growing from the trunk is trained horizontally from the trunk to serve as a cordon and is bent in the same manner as the old cordon, and the old cordon is then cut back to the trunk.

3,585,757

## OVERHEAD OPENING PLUG DOOR

Kenneth Ritchie, Malibu, and Leonard Schroedter, La Palma, both of, Calif., assignors to McDonnell Douglas

Filed July 3, 1969, Ser. No. 838,949
Int. Cl. E05d 15/20
U.S. Cl. 49—215 8 Claims



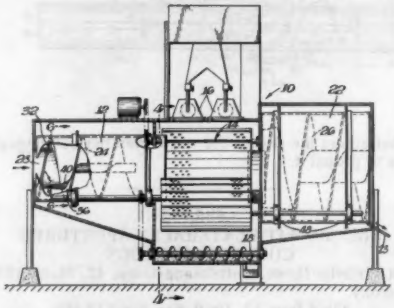

An overhead opening plug door for a pressurized aircraft cabin wherein the door is counterbalanced for manual emergency opening in event of power failure, yet the door is easily closed and sealed in normal operation. Power actuated cables move the door, which is roller mounted on tracks of nonconstant curvature, by means of push-pull rods and cam linkages into open and closed position.

3,585,758

## CONTINUOUS CLEANING APPARATUS

Willard J. Harper, Hagerstown, Md., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Apr. 11, 1969, Ser. No. 815,379
Int. Cl. B24c 3/30
U.S. Cl. 51—13 13 Claims



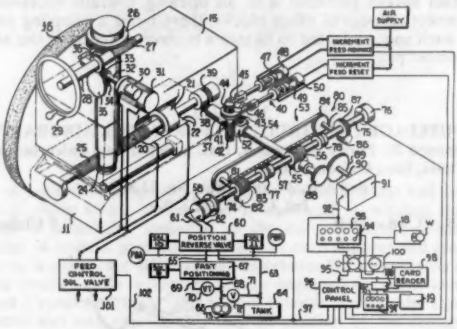

A continuous treating apparatus such as used for the abrasive cleaning of castings includes a treating chamber which communicates with an infeed chamber and an exit chamber, at least one of which is tubular. A spiral article conveyor is mounted on the inner surface of the tubular chamber and a center tube or bridging element is disposed at the entrance of the tubular chamber and connected to the first flight of the spiral conveyor.

3,585,759

## MACHINE TOOL CONTROL SYSTEM

Jorgen R. Andresen, Shaker Heights, Ohio, assignor to Litton Industries, Inc.

Filed Apr. 17, 1968, Ser. No. 722,116
Int. Cl. B24b 49/00
U.S. Cl. 51—165 28 Claims




This disclosure relates to a control mechanism for automatically actuating a feed mechanism for a machine tool slide to shift the slide from a known prior position to a selected new position. The control mechanism primarily consists of an electrical circuit of the logic type which differs from prior utilized circuits in the following manner:

1. There is no control element such as a switch or similar device for providing a signal to indicate when the slide is in or passing through the selected position.

2. The "On The Target" signal is obtained when the output from a position indicating encoder coincides with the input from a dial or punch card.

3. The "Forward" signal is obtained when the output from the position encoder is greater than the input from a dial or a punched card.

4. The "Reverse" signal is obtained when the output from the position encoder is less than the input from a dial or a punched card.

A signal is available not only to stop a driving member, but also to signal a circuit for reversing the driving member and determining the speed at which the driving member drives the slide. The final movement of the slide towards the selected position is always in the same direction, that is, forward and at a minimum of speed referred to hereinafter as a "Creep" speed. When the slide reaches the selected position at this speed and the position signal stops the driving member, there is not sufficient inertia to carry the slide beyond the positioning movement. When the set new position of the slide is an initial position, further advance of the slide for machining operation is effected by the usual feed mechanism.

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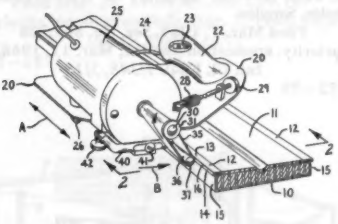
**3,585,760**

## PORTABLE SKI SHARPENER

**Stanley M. Richmond, 331 Eugene Medical Center, Eugene, Oreg.**

**Filed June 30, 1969, Ser. No. 837,556**
**Int. Cl. B24b** *23/00*
**U.S. Cl. 51—170 EB** **9 Claims**



A power-operated device which utilizes the smooth ski bottom and one edge of the ski as guides for applying an abrasive element to the projecting metal edge at right angles to the bottom surface. No part of the sharpener extends more than a few millimeters past the metal edge to be sharpened so that mountings, screws, plates and cable anchors on the top and sides of the ski do not have to be removed.

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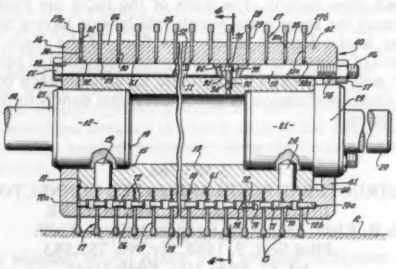
**3,585,761**

## ROTARY CUTTER ASSEMBLY

**Warren J. Hughes, Centerville, and Donald H. Mabey, Salt Lake City, both of, Utah, assignors to Christensen Diamond Products Company, Salt Lake City, Utah**

**Filed Jan. 3, 1969, Ser. No. 788,838**
**Int. Cl. B24d** *5/00*
**U.S. Cl. 51—207** **19 Claims**



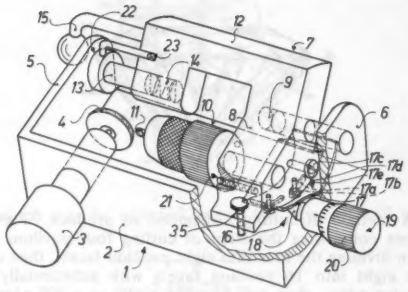
A rotary cutter assembly in which an arbor has end plates and a multiplicity of saw discs and disc-separating spacers surrounding the arbor between the end plates. Bolts clamp the spacers and the saw discs to each other and to the end plates, the bolts also keying the spacers directly to the arbor so that torque is transmitted from the arbor to the spacers, and from the spacers to the saw discs.

**3,585,762**

## DRILL GRINDING MACHINE PARTICULARY FOR SPIRAL DRILLS

**Werner Steinmetz, Wetzikon, Switzerland, assignor to Mahog AG, Dubendorf, Switzerland**

**Filed Oct. 24, 1968, Ser. No. 770,278**
**Claims priority, application Switzerland, Oct. 24, 1967, 14829/67**
**Int. Cl. B24b** *19/00*
**U.S. Cl. 51—219** **14 Claims**



The feeding device includes a pivotal lever which is pivotal lever which is pivotal about an axis oriented at an angle to the axis of the grinding wheel. The pivotal lever is pivotal toward and away from the grinding wheel and carries a chuck for clamping the drill to be ground. The pivotal lever is also displaceable longitudinally of its pivot axis, and is so coupled with a guiding device that the drill end to be ground is fed to the grinding wheel and is relief-ground by leading it along the grinding wheel or disc.

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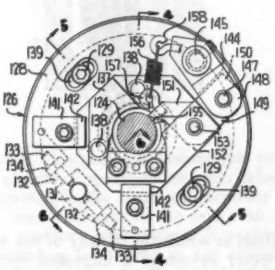
**3,585,763**

## WORK-DRIVING DEVICE FOR CAMSHAFT GRINDER

**Wilbur R. Clark, Waynesboro, Pa., assignor to Litton Industries Inc.**

**Filed July 12, 1968, Ser. No. 744,349**
**Int. Cl. B24b** *5/02, 41/06*
**U.S. Cl. 51—237** **12 Claims**



This disclosure relates to a work-driving apparatus, particularly for a cam contour grinder, for applying a driving torque at two angularly spaced points on a workpiece so that the entire force transmitted by the work-driving apparatus acts to turn the workpiece and there is no force to cause radial displacement of the workpiece. The work-driving apparatus is particularly adapted for use in conjunction with a workpiece having an end portion of a reduced diameter with a keyway formed therein. The work-driving apparatus includes a driving block which carries a locating pin which is proportioned for a close fit in the keyway to maintain the workpiece in a predetermined oriented position during the grinding thereof. The driving block is mounted for floating movement so as to compensate for variations in workpieces and is pivotable about the locating pin to engage a separately

mounted jaw carried thereby with the workpiece at a point circumferentially remote from the locating pin.

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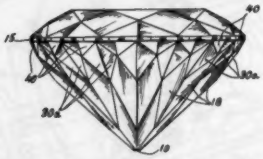
**3,585,764**
**DIAMOND CUTTING METHOD**
**James Huisman, and Harry Huisman, both of c/o Huisman Bros. 1270 Aves. of America, New York, N.Y.**
**Filed June 10, 1969, Ser. No. 831,973**
**Int. Cl. B24b** *1/00*
**U.S. Cl. 51—283** **9 Claims**



A method of cutting a diamond to produce 72 pavilion facets comprising the steps of cutting four pavilion facets, then dividing the four into eight pavilion facets, then cutting the eight into 16 pavilion facets with substantially overlapping edges, then polishing the girdle to a 90° edge, then cutting a facet at 53° at each overlap and intermediate each overlap, then dividing each such latter facet into three facets such that each latter facet is provided with a diamond shape, and then cutting 38 facets into the girdle.

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**3,585,765**
**FLAP WHEEL**
**Howard J. Mc Aleer, Detroit, Mich., assignor to Formax Manufacturing Corporation, Detroit, Mich.**
**Filed Jan. 13, 1969, Ser. No. 790,525**
**Int. Cl. B24b** *9/02*
**U.S. Cl. 51—334** **7 Claims**

A flap wheel in which the density of the work material at the radial outer extremity is increased by the addition of extra shorter flaps.

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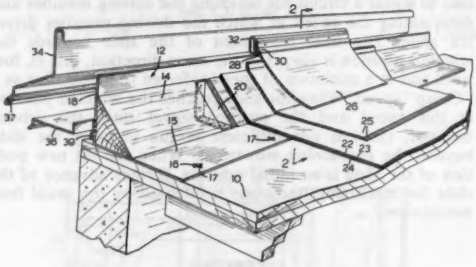
**3,585,766**
**FLASHING CONSTRUCTION**
**Leslie Guy Jamieson, 178 King Street, Weston, Ontario, Canada**
**Filed June 9, 1969, Ser. No. 831,627**
**Claims priority, application Canada, Feb. 21, 1969, 043,585**
**Int. Cl. E04d** *13/15*
**U.S. Cl. 52—60** **8 Claims**

This invention relates to a flashing construction for a flat roof wherein a seat for a cant is first rigidly connected along the marginal edge of the roof. The cant is subsequently located in the seat. A flexible weatherproof flashing membrane is secured to the upper edge of the seat and adapted to cover the cant and merge with the roofing felt and roofing pitch to form a weathertight flashing construction. The principal advantage of the construction is that the roofing operation can be carried out by the roofers without the necessity of assistance from carpentry and other trades.



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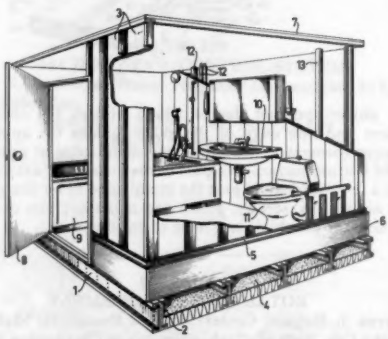
**3,585,767**
**PREFABRICATED ROOM UNIT**
**Torsten Gunner HERMAN Wilk, Lindingo, and Ove Rosto, Farsia, both, Sweden, assignors to WRW-Produkter AB, Stockholm, Sweden**
**Filed Mar. 7, 1969, Ser. No. 805,326**
**Claims priority, application Sweden, Mar. 12, 1968, 3226/68**
**Int. Cl. E04b** *1/348, 5/10*
**U.S. Cl. 52—79** **5 Claims**



A prefabricated room unit designed for use in constructing modular buildings. The prefabricated room unit is formed of a plurality of identical sheet metal panels of substantially U-shaped cross section. The walls of the room are formed by disposing the sheet metal panels side-by-side having their adjacent lateral flanges joined. The floor of the room unit is formed of substantially identical panels mounted in pairs with their web portions in contact and secured to each other so that each combination of two sheet metal panels forms an I-type beam.

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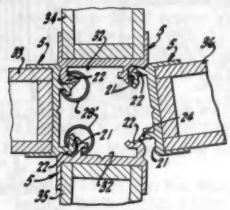
**3,585,768**
**STRUCTURAL POSTS AND PANEL CONNECTORS INCLUDING PANEL STRUCTURE**
**Louis H. Klein, 1328 Vista Granda, Milbrae, Calif.**
**Filed Sept. 5, 1968, Ser. No. 757,583**
**Int. Cl. E04c** *3/32;* **E04b** *1/343*
**U.S. Cl. 52—731** **1 Claim**

An interlocking post-joint structure for forming rectangular metal posts adapted to function alone or to support one, two, three, or four panels of a wall in planar or right angle positions, and which posts, for all of the aforesaid arrangements, have four interlocking sides formed from combinations of extrusion strips of different or identical outer cross-

sectional contours but internally having identical interlocking means integral therewith, adapted to interlock against



separation in directions normal to the respective sides of each post when held in assembled relation.

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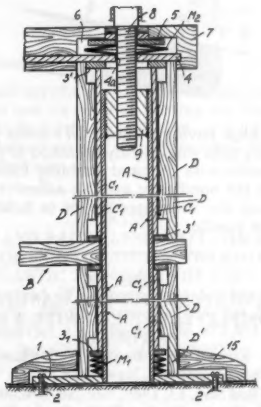
**3,585,769**
**SPIRAL OR WINDING STAIRCASE WITH WOODEN STEPS AND METAL NEWEL**
**Verderio Giuseppe, Via Padana Superiore 1, Gessate, Italy**
**Filed Mar. 24, 1969, Ser. No. 809,767**
**Claims priority, application Italy, Apr. 1, 1968, 14,675A/68**
**Int. Cl. E04f** *1/00*
**U.S. Cl. 52—187** **4 Claims**



A device for a winding staircase having woden steps stabilized on a newel and with each other by muffle spacers. The newel is fitted with elastic tightening means which keep the muffle spacers pressed against the steps to develop an elastic reaction which compensates for loosening caused by step shrinkage. Elastic tightening means are also provided for vertical connections between the outer ends of the steps, as well as in all other handrail balusters, along the outer contour of the staircase.

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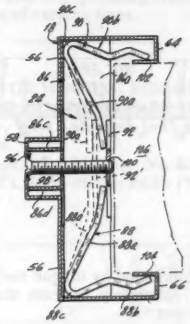
**3,585,770**
**STEEL DOOR FRAME**
**Nathan Maizler, Miami Beach, Fla., assignor to Maizler Iron Works, Inc., Miami, Fla.**
**Filed June 6, 1969, Ser. No. 830,935**
**Int. Cl. E06b** *1/20*
**U.S. Cl. 52—217** **7 Claims**

A door frame assembly for installation around a passageway formed in an existing wall which includes a head frame and a pair of door jambs each door jamb being held in place by a pair of bottom anchors which engage the door jamb and are fastened to the outer surface of the surrounding walls and a clamping device positioned within each door



jamb which may be adjusted to grip the adjacent wall surfaces.

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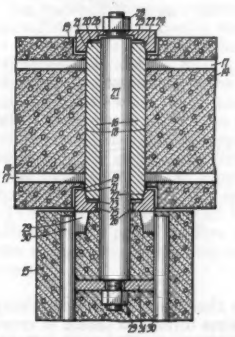
**3,585,771**
**CONNECTING PRECAST CONCRETE STRUCTURAL MEMBERS**
**Stewart George Pinniger, 13 Fairview Street, Hawthorn, Victoria, Australia**
**Filed May 19, 1969, Ser. No. 825,859**
**Int. Cl. E04b** *1/40, 1/41*
**U.S. Cl. 52—251** **10 Claims**



This invention is directed to a connection assembly for joining precast structural members together wherein metal members are provided on the structural members and which are attached to reinforcements in the said structural members, said metal members having taper formations thereon engaging corresponding formations in end clamp members adapted to be drawn together to effect engagement of outer faces of the metal members with a central shaft passing through the connection assembly and cooperating with the end clamp members, the arrangement providing for a column supported or unsupported connection through which the whole of the moment forces are transferred.

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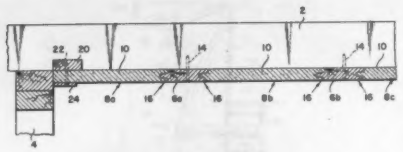
**3,585,772**
**CEILING TILE SYSTEM**
**Norman Seegert, International Falls, Minn., assignor to Boise Cascade Corporation, Boise, Idaho**
**Filed Mar. 29, 1968, Ser. No. 717,320**
**Int. Cl. E04b** *5/52*
**U.S. Cl. 52—496** **1 Claim**

An improved ceiling tile system that avoids the use of conventional furring strips, characterized by the provision of

spaced parallel exposed decorative support strips for connecting rows of ceiling tile arranged therebetween to the lower surfaces of joists. The adjacent side edges of the strips



and tile rows are connected by tongue and groove joints, said strips extending transversely beneath the joists and being nailed directly thereto.

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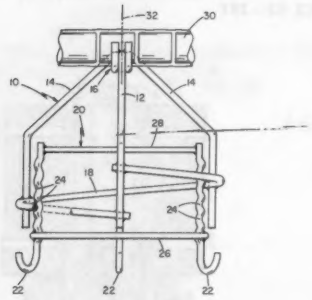
**3,585,773**
**REINFORCEMENT BAR SUPPORT**
**Albert M. Seppala, 92 Granite St., Rockport, Mass.**
**Filed July 23, 1969, Ser. No. 844,091**
**Int. Cl. E04c** *5/16;* **F16m** *11/20*
**U.S. Cl. 52—678** **10 Claims**



A two-piece chair bar support comprising a support piece having three wires forming a saddle to receive and support a chair bar, said wires extending outwardly and downwardly to also support a helical wire segment on the inside of said wires, and a base having three legs, inwardly of said helical segment, each having a plurality of undulations, said helical segment engaged in said undulations and said legs interconnected at the points of upper and lower triangular frame members; said support and base pieces adjustable by relative rotation thereof with said helical strip segment in said undulations.

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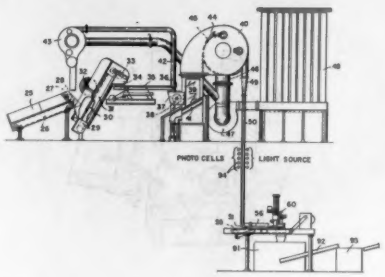
**3,585,774**
**APPARATUS AND METHOD FOR DIVIDING CUT TOBACCO INTO PACKAGE-SIZE WEIGHTS**
**Lorne A. Rowell, Lachine, Quebec, and Roger LaFleur, Greenfield Park, Quebec, both of, Canada, assignors to Imperial Tobacco Company of Canada Limited, Montreal, Quebec, Canada**
**Filed Mar. 3, 1969, Ser. No. 803,795**
**Int. Cl. B65b** *1/24, 25/02, 57/14*
**U.S. Cl. 53—23** **13 Claims**

Loose cut tobacco is fed via a feeder, a tower separator and a special tangential separator to the upper end of an upright conduit to form a column of substantially uniform density therein, a conveyor conducting a substantially uniform stream of tobacco from the lower end of said conduit to cutter means for cutting off the proper length of said stream equivalent to a predetermined weight of tobacco,




wiper means wiping said cut length off the conveyor to a packaging machine.

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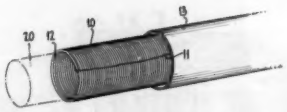
**3,585,775**
**BULK PACKAGING OF ARTICLES**
**Benjamin Henry Stenniken, East Brighton, Victoria, Australia, assignor to Engelhard Industries Pty. Ltd., Thomastown, Victoria, Australia**
**Filed Oct. 20, 1969, Ser. No. 867,709**
**Claims priority, application Australia, Oct. 21, 1968, 45107/68**
**Int. Cl. B65b** *63/04*
**U.S. Cl. 53—23** **4 Claims**



A bulk package having a bundle of closely packed soldering and brazing split rings tightly sheathed in plastic material removable portionwise by hand enabling individual rings to be freed from the bundle for use. No adhesive of any kind is needed to keep the rings together or to hold the sheathing material to the bundle.

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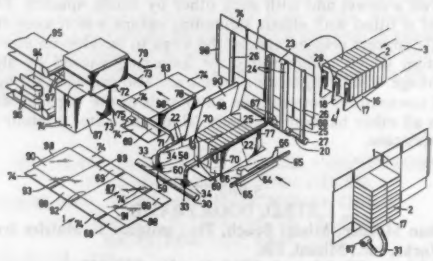
**3,585,776**
**PROCESS AND APPARATUS FOR MANUFACTURING A BOX COMPLETELY FILLED WITH A STACK OF ARTICLES**
**Gerrit Evert Euwe, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.**
**Filed Nov. 13, 1969, Ser. No. 876,406**
**Claims priority, application Netherlands, Nov. 15, 1968, 68/6267**
**Int. Cl. B65b** *11/42*
**U.S. Cl. 53—32** **7 Claims**



In a machine for wrapping a slotted and scored flat box blank about a stack of articles such as packages, a stack is fed from an advancing row of articles on to a first tiltable platform in a horizontal position. A second tiltable platform to which a blank has been fed is swung upwardly to present the blank in a vertical plane to a side face of the stack in the

first platform, and both platforms then tilt downwardly in unison to bring the blank back to the horizontal position with the stack supported on the blank. Folder arms operate to erect sidewall panels of the blank as the platforms swing downwardly, and the partly formed box and stack are then moved horizontally by a pusher flight, perpendicularly to the plane of tilting, past a top panel folder and past end flap gluers and folders.

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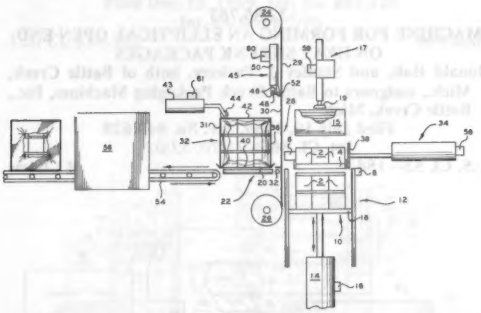
**3,585,777**

**APPARATUS AND METHOD FOR PACKAGING A PLURALITY OF ARTICLES**

**Herman Pesch, Kansas City, Mo., assignor to Phillips Petroleum Company**

**Filed Oct. 2, 1969, Ser. No. 863,199**
**Int. Cl. B65b** *35/50, 53/06*
**U.S. Cl. 53—26** **10 Claims**



A method and apparatus for automatically stacking a plurality of articles one on another, moving the stacked articles, covering the stacked articles with film, and heating the film covering the stacked articles thereby forming the plurality of articles into a package.

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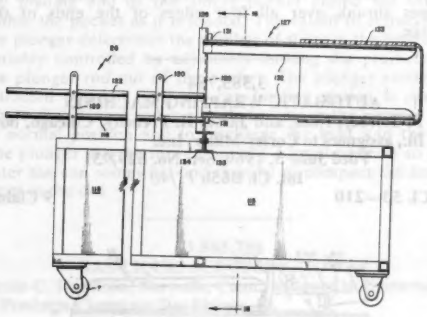
**3,585,778**

**STACKING AND PACKAGING UNIT FOR USE WITH MACHINE FOR CONTINUOUSLY THERMOFORMING PLASTIC TRAYS OR THE LIKE**

**Thomas W. Winstead, Williamson Lane, Cockeysville, Md.**

**Division of Ser. No. 480,917, Aug. 19, 1965, Pat. No. 3,479,694.**
**Filed Oct. 13, 1969, Ser. No. 871,095**
**Int. Cl. B65b** *57/20, 39/02*
**U.S. Cl. 53—78** **7 Claims**



A tray stacking and packaging unit for use with apparatus for continuously manufacturing trays or the like and having a tray delivery chute. A trackway successively receives the trays delivered by the chute in edgewise position, and a plunger advances them along the trackway to a bag spreading frame which supports an open-ended bag for receiving the advancing trays. A tray counting device is associated with the trackway for controlling the number of trays delivered to the bag. The trackway and bag spreading frame are adjustable to accommodate trays of varying sizes.

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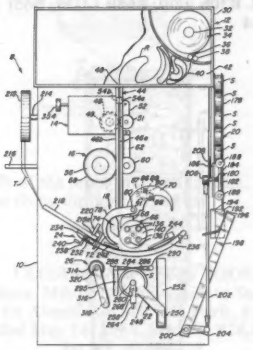
**3,585,779**

**APPARATUS FOR WINDING RIBBON MATERIAL APPLYING WRAPPING TAPE THERETO**

**Josephus J. Thayer, West Lafayette, Ind., assignor to Thayer, Inc., Wolcott, Ind.**

**Filed Apr. 17, 1967, Ser. No. 631,368**
**Int. Cl. B65b** *49/00;* **B65h** *19/20*
**U.S. Cl. 53—118** **23 Claims**



Spools are fed sequentially to a rotatable support where they are rotated. The leading end of an indeterminate length of ribbon is projected and guided around the core of the rotating spool and is pressed inward against the core for frictional engagement therewith to assist in feeding of the ribbon and to effect snubbing of the ribbon end on the rotating core. Continued rotation of the core winds the ribbon thereon. An adjustable reset meter is driven by the ribbon passing to the core and is operative to stop the rotating support to control the length of ribbon wound on each spool. Wrapping tape is positioned beside the filled spool on the support. The tape and ribbon are temporarily clamped to the spool core and the ribbon is cut. The spool is then moved in a direction toward the tape and between a pair of folders which fold the tape ends about the ribbon into overlapping relation where they are secured together.

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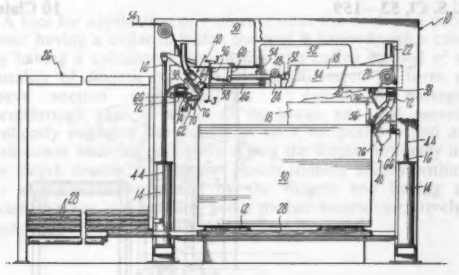
**3,585,780**

**STRAPPING MACHINE INCLUDING FEEDER FOR EDGE PROTECTORS**

**James Elmore, Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.**

**Filed May 21, 1969, Ser. No. 826,509**
**Int. Cl. B65b** *13/18, 13/20*
**U.S. Cl. 53—124** **10 Claims**



A compression strapping machine for binding large bundles, such as a stack of plywood, includes a hopper fed

dispensing device for edge protectors capable of firmly and accurately positioning the protectors between the bundle and the encircling strap for protecting the edges of the bundle from damage. The device includes a leaf spring and dashpot movable with the dispenser for controllably positioning a protector support in alignment with a delivery station, the support receiving and retaining the protector in position prior to tightening of the strapping. The dispensing device is laterally movable to accommodate packages of different width.

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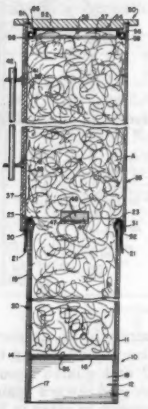
**3,585,781**
**DEVICE FOR CONTAINING, COMPACTING AND BALING REFUSE**
**Frank Gordon Blee, 6 Marion road, Upper Montclair, N.J.**
**Filed July 30, 1969, Ser. No. 846,054**
**Int. Cl. B30b** *9/00;* **B65b** *13/20;* **B65f** *1/06*
**U.S. Cl. 53—124** **20 Claims**



The device comprises a box and a tubular slide telescoped over said box and adapted to be supported on this box in extended position to form with this box a container for refuse. A removable bag lines the box and a ram is adapted to be placed over said slide to cover said slide when the container is filled. With the slide covered by the ram, the means mounting the tubular slide in extended position is released and the ram covered slide is pushed down over the box to compress the refuse, until the slide reaches a position in which the refuse has been all compressed and is contained in the bag lining the box. The bag can be closed to form a bale, and this bale can be removed from the box.

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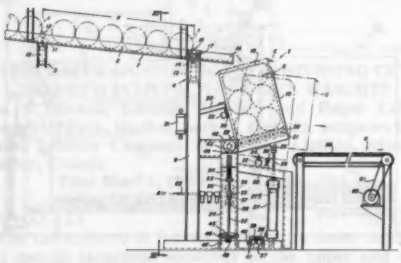
**3,585,782**
**CARTON FILLING APPARATUS**
**James D. Staley, Muscatine, Iowa, assignor to H.J. Heinz Company, Pittsburg, Pa.**
**Filed Dec. 10, 1969, Ser. No. 883,740**
**Int. Cl. B65b** *35/32*
**U.S. Cl. 53—159** **10 Claims**



An apparatus is disclosed for the end loading of filled cans of products into a carton by gravity. It is especially adapted for use with large diameter cans. The cans roll down an inclined track in which there are two spaced movable barriers which function to divide the progression of cans into case lots and restrain each successive lot in loading position. A carton is placed upright in a carton holder which is then tilted backward so that the open top of the carton is underneath the lower end of the trackway. With the release of the first restraining barrier, the case lot falls into the carton while the second barrier holds back the procession of cans behind it. The tilt of the carton is such that the cans will arrange themselves in layers. The holder returns the filled carton to upright position and the carton rolls from the holder onto a receiving conveyor. Upon return of the filled carton to upright position, the first barrier is raised while the second barrier is released until another case lot has rolled onto the lower terminal portion of the track, being blocked on the terminal portion by the first barrier. Foot pedals and pneumatic operators sequence the operations.

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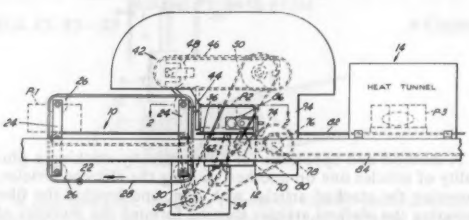
**3,585,783**
**MACHINE FOR FORMING AN ELLIPTICAL OPEN END ON HEAT SHRUNK PACKAGES**
**Ronald Holt, and Stanley J. Puskarz, both of Battle Creek, Mich., assignors to Battle Creek Packaging Machines, Inc., Battle Creek, Mich.**
**Filed July 10, 1969, Ser. No. 840,628**
**Int. Cl. B65b** *11/10, 53/02*
**U.S. Cl. 53—184** **4 Claims**




Wrapping machine positions heat-shrinkable wrapper around package with underlapped side edges along the bottom of the package. A conveyor advances the package to a bottom sealer, with driven bottom belts holding underlap tight, to a heated sealer that fuses the lap. Backing rolls located at the sides of the conveyor are advanced into the open tubular ends of the wrapper as the package advances over the sealer, so that the sealer forms the wrapper in a complete tube from end to end. Backing rolls retract out of the tube and package is advanced to a heat shrink tunnel where the continuous tubular form of the ends of the wrapper cause it to shrink into an elliptical opening with the wrapper shrunk over all four edges of the ends of the package.

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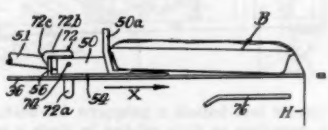
**3,585,784**
**AUTOMATIC WRAPPING MACHINE**
**Fritz F. Trieber, Niles, and James H. Frenchy, Chicago, both of, Ill., assignors to Corley-Miller, Inc.**
**Filed June 3, 1969, Ser. No. 829,931**
**Int. Cl. B65b** *11/40*
**U.S. Cl. 53—210** **9 Claims**



In an automatic wrapping machine which has means for moving a package into a sheet of wrapping film adjacent the

free end of the film to cause preliminary wrapping of the film about the package with the free end of the film under the package and for banding the film about the package as the package is moved in a predetermined path to complete the wrapping of the film about the package and to overlap the free end of the film, an improvement which comprises palletlike means on which rests at least the portion of the package over which the free end of the film is wrapped for holding the film at the free end thereof against the package while the package is moved in said predetermined path to complete the wrapping of the film about the package. The palletlike means moves with the package and prevents the free end of the film from parting therefrom and thereby insures a complete wrap of the film about the package.

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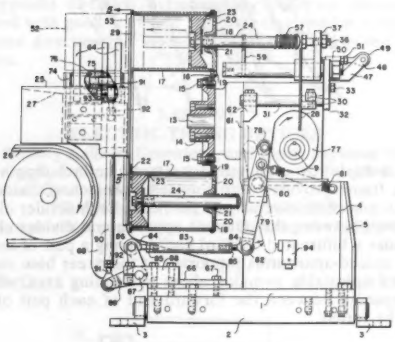
**3,585,785**

**AUTOMATIC CAN PACKER FOR PINEAPPLE SLICES**

**Russell R. Smith, Honolulu, Hawaii, assignor to Castle & Cooke, Inc., Honolulu, Hawaii**

**Filed Dec. 15, 1969, Ser. No. 885,120**
**Int. Cl. B65b** *5/06*
**U.S. Cl. 53—252** **10 Claims**



Pineapple slices are loaded automatically into a substantially cylindrical pocket in an intermittently rotating turret and carried to a can loading station where the load is discharged into an empty can. A plunger normally maintains the loading end of the empty pocket closed but retracts within the pocket as it is loaded. The extent of retraction of the plunger determines the number of slices in the load and is variably controlled by adjustably limiting the projection of the plunger rod out of the pocket. The plunger remains in retracted position until the can loading station is reached where the plunger rod is actuated to move the plunger back to normal position and to discharge the load into the can. The plunger may be moved beyond normal position so as to enter the can somewhat and thereby to compact the load of slices in the can.

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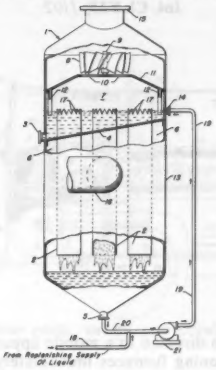
**3,585,786**

**GAS-LIQUID SCRUBBING TOWER**

**Leslie C. Hardison, Norwalk, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.**

**Filed Aug. 12, 1968, Ser. No. 751,913**
**Int. Cl. B01d** *47/00*
**U.S. Cl. 55—257** **4 Claims**

A scrubbing tower for effecting a high degree of mass transfer without turbulence between a liquid and gas comprising a tower, divided into upper and lower sections by a partition, tubes extending through said partition, and appropriate liquid and gas inlets and outlets, whereby a liquid introduced into the upper section of the tower flows down




the inside walls of the tubes in a laminar film, where it is contacted by a gas rising through the tubes.

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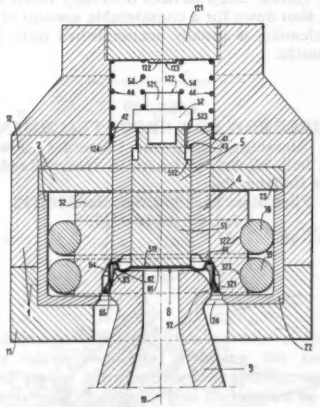
**3,585,787**

**CLOSURE-APPLYING TOOL**

**Armando Podesta, Milan, Italy, assignor to Societe De Conditionnement En Aluminium Scal GP, Paris, France**

**Filed May 14, 1969, Ser. No. 824,463**
**Int. Cl. B65b** *7/28*
**U.S. Cl. 53—344** **10 Claims**



A tool for application of a closure onto the neck of a container having a collar in which the tool is formed with a casing having a cylindrical cage within the casing formed of a plurality of fingers circumferentially arranged to form a sleeve section which defines a cylindrical passage therethrough that is wider at its lower end and means resiliently engaging the fingers at their midportions and at their lower ends for resiliently urging the fingers inwardly in the sleeve section, an annular punch slidable axially within the sleeve section formed by the fingers and having a widened lower end portion, and a pusher means operatively engaging the punch for axial movement therewith.

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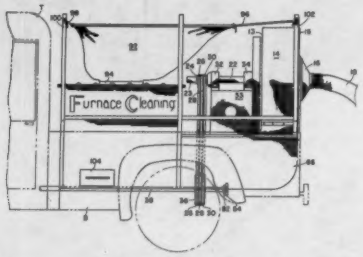
**ERRATUM**

For Class 55—257 see:
Patent No. 3,585,786

3,585,788
**MOBILE FURNACE CLEANING APPARATUS**
Wilbern A. Wilson, 713 Morgan Ave., Asheboro, N.C.
Filed Jan. 2, 1969, Ser. No. 788,384
Int. Cl. F23j *1/02*
U.S. Cl. 55—473 4 Claims




This invention is directed to a mobile apparatus employing a vacuum for cleaning furnaces immediately after they are shut off, eliminating the usual waiting period for the furnace to cool. The device includes a source of suction communicating with the interior of a furnace creating an enclosed airflow path from the furnace outwardly, carrying with it smoke, pieces of hot coals, and debris pulled from the furnace walls. A series of fire resistant filters interrupts the airflow path and removes the hot cinders, pieces of carbon, and other soot and debris from the airflow path. A final filter comprises a cloth billow through which the clean air is expelled to the atmosphere.

Furnace cleaning, according to present devices employed, is a slow and tedious process, and requires the furnace to be shut down and cooled completely before cleaning. Present methods include either manually scraping the inside of the furnace or applying suction to the furnace after it has completely cooled. Such devices obviously result in the furnace being shut down for a considerable amount of time, and therefore cleaning is usually accomplished only during the summer months.

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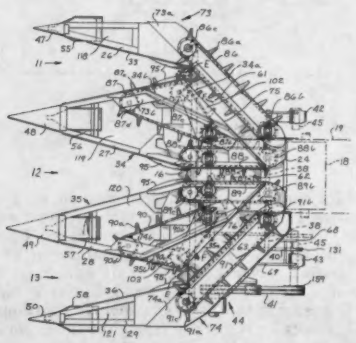
3,585,789
**THREE ROW ROW CROP ATTACHMENT**
Allison W. Blanshine, Lititz, and Edward C. Procter, New Holland, both of, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Mar. 26, 1969, Ser. No. 810,712
Int. Cl. A01d *45/02*
U.S. Cl. 56—98 13 Claims



A three row row crop attachment has a frame and crop guides forming three passages. Twelve upper and lower crop gathering chains pull stalklike crops through the passages against a cutting sickle and deliver the crops through narrow troughs of the passages to the feed rolls of a supporting forage harvester. The upper and lower crop gathering chains are in six sets. The crop gathering chains of each set are on opposite sides of a passage with the lower chains in each of the troughs extending to the feed rolls. The lower crop gathering chains are on three levels and the upper crop gathering chains are on two levels. The frame and the crop guides are interiorly open for clearing debris. The wobble gear drive is recessed clear of the various drives and the power takeoff.

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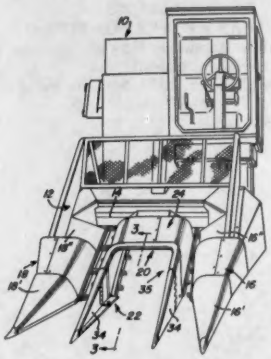
3,585,790
**CORN HARVESTER SPLIT ADJUSTABLE SNOUT CONSTRUCTION**
Lester Kalkwarf, R.F.D. 2, Aurora, Nebr. 68818
Filed May 26, 1969, Ser. No. 827,612
Int. Cl. A01d *45/02*
U.S. Cl. 56—119 8 Claims



A multiple row corn head for a combine including a transverse frame provided with forwardly projecting divider elements spaced transversely of the head. Each divider element disposed between the outer or opposite end divider element includes a bifurcated forward end defining a pair of horizontally spaced-apart arms supported at their rear base ends for limited adjustable swinging about upstanding axes, whereby the spacing between the forward end of each pair of arms may be varied.

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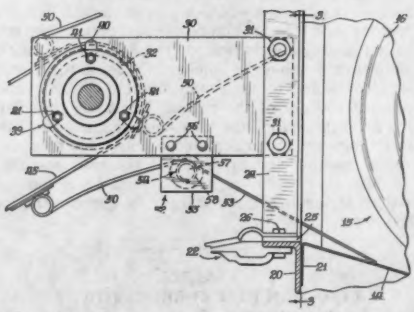
3,585,791
**DRAPER PICKUP SERVICE**
Stephen L. Batog, Moline, Ill., assignor to J. I. Case Cmpany
Filed Mar. 10, 1969, Ser. No. 805,612
Int. Cl. A01d *43/02*
U.S. Cl. 56—364 6 Claims



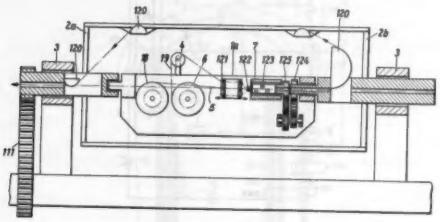
A draper pickup device for picking up windrowed crops and transferring the crops into a cross-conveyor of a crop handling machine, such as a combine, with the pickup device including a hinged wiper plate positioned in crop stripping relationship with respect to the crop pickup fingers on the pickup device.

3,585,792

## METHOD AND MACHINE FOR MANUFACTURING CABLES

Wilhelm Hofrichter, Bramsche near Osnabruck, Germany, assignor to E. Vornbaumen & Co., Iburg T.W. near Osnabruck, Germany

Filed Feb. 5, 1969, Ser. No. 796,737
Claims priority, application Germany, Feb. 14, 1968, P 16 85 857.4
Int. Cl. D01h *1/10, 7/86*
U.S. Cl. 57—58.52 7 Claims



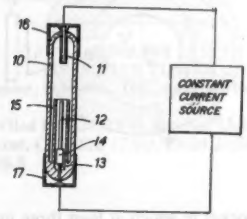
A method of and high speed machine for stranding to form ropes from filaments by feeding filaments from storage spools to a rotary stranding head. Rope issues from the machine in the opposite direction by employing deflector devices associated with guide carriers. The stranding head is rotated in the same direction but at about twice the speed as the guide carriers.

3,585,793

## ELECTRIC TIMING DEVICES

Philip Rodney Kellner, Greenford, and Derek Seymour Allam, Cranleigh, both of, England, assignors to S. Davall & Sons Limited, Greenford, England

Filed Nov. 7, 1969, Ser. No. 874,989
Claims priority, application Great Britain, Nov. 12, 1968, 53582/68
Int. Cl. G04f *1/00, 11/00*
U.S. Cl. 58—1 6 Claims




A sealed glass cell contains a solution of silver perchlorate in pyridine with other additions as an electrolyte. A hollow platinum cathode attached to an end cap projects through the cell wall at one end and a long silver cathode attached to an end cap projects through the cell wall at the other end. A glass tube surrounds the cathode. A constant current is passed through the cell which dissolves away the cathode. The length of the cathode measured against a scale on the wall of the cell gives a measure of time.

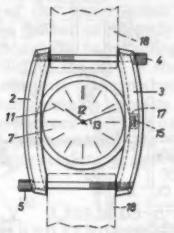
3,585,794

## WRISTWATCH WITH ADJUSTABLE CASE HOLDER

Hans Ulrich Klingenberg, St. Niklaus near Merslingen, (Canton of Berne), Switzerland

Filed Apr. 21, 1969, Ser. No. 817,926
Claims priority, application Switzerland, May 1, 1968, 6487/68
Int. Cl. G04b *37/00*
U.S. Cl. 58—88 W 9 Claims

A frame composed of two side bars and of two screws acting as wristlet lugs clamps the case between the bars. The appearance of the watch can be varied by changing the position of the case within the frame, by substituting a different case



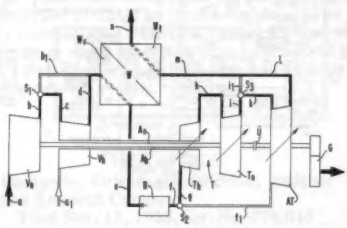
or different frame parts, or by any combination of these ways.

3,585,795

## GAS TURBINE ASSEMBLY HAVING LOW-PRESSURE GROUPS AND HIGH-PRESSURE GROUPS ADAPTED TO BE SELECTIVELY CONNECTED EITHER IN SERIES OR IN PARALLEL

Hubert J. Grieb, Stuttgart-Botnang, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Dec. 30, 1968, Ser. No. 787,905
Claims priority, application Germany, Dec. 30, 1967, P 16 26 033.6
Int. Cl. F02c *1/06, 9/02, 3/10*
U.S. Cl. 60—39.16 21 Claims



A gas turbine installation which includes a combustion chamber, a compressor unit supplying the combustion chamber and having a low-pressure compressor and a high-pressure compressor, a drive turbine unit driven by the combustion gases and driving the compressor unit, and an output engine driven by the combustion gases, in particular an output turbine, whereby the low-pressure compressor and high-pressure compressor are adapted to be connected either in series or in parallel.

3,585,796

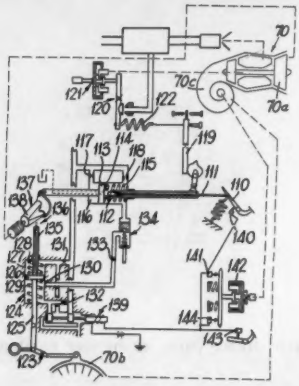
## GAS TURBINE CONTROL SYSTEM

Geoffrey Arthur Lewis, Olton, Solihull, England, assignor to Joseph Lucas (Industries) Ltd., Birmingham, England

Filed July 15, 1969, Ser. No. 841,817
Int. Cl. F02c *9/02*; F02g *3/12*; F02c *3/10*
U.S. Cl. 60—39.16 21 Claims

In a control system for a gas turbine control system which has mechanically adjustable work turbine stator vanes, there is a throttle-actuated servo device which produces a mechanical output and an hydraulic pressure signal. The device includes a flow restrictor which slows down the device during acceleration so that the pressure signal falls for a

period during which a vane-adjusting servo device opens the stator vanes in response to a change in the hydraulic pressure



signal. This period lasts until the throttle servo is restored to equilibrium.

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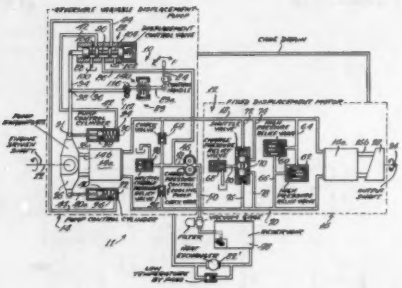
**3,585,797**

## HYDROSTATIC TRANSMISSION DISPLACEMENT CONTROL

**Harry C. Moon, Jr., Oglesby, Ill., assignor to Sundstrand Corporation**

**Filed June 9, 1969, Ser. No. 831,596**
**Int. Cl. F16d** *31/06*
**U.S. Cl. 60—53** **12 Claims**



A servomechanism for the displacement control of a hydrostatic transmission which includes a manual control handle connected through a three-point link to position a displacement control servo valve, and a feedback connection to the link whereby the link has three pivotal interconnections with a spring biasing the servo valve in a direction to decrease the displacement of the transmission for the purpose of reducing backlash in the link and a second spring for urging the control handle linkage away from the link to reduce backlash between the control handle and the control handle linkage.

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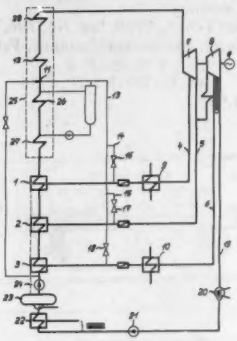
**3,585,798**

## METHOD AND ARRANGEMENT FOR INCREASING THE SPEED OF LOAD CHANGES IN GROUPS OF POWER PLANTS

**Klaus Knizia, Nochen Ueber Engelskirchen, Germany, assignor to Brown, Boveri & Cie, Mannheim, Germany**

**Filed Nov. 18, 1968, Ser. No. 776,536**
**Claims priority, application Germany, Nov. 18, 1967, P 16 01 006.3**
**Int. Cl. F01k** *7/16*
**U.S. Cl. 60—67** **4 Claims**

A method of increasing the load change velocity of power plant blocks, characterized in that during the dynamic operation of the power increase, the tapped quantities of stream for the high pressure preheater which in stationary operation are withdrawn through withdrawing steam conduits from the



turbine are throttled by steam ahead of the superheater or the end superheater of the steam generator or are stopped completely.

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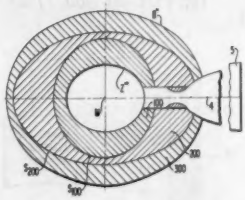
**3,585,799**

## ROCKET MOTOR PROPELLANT

**Paul Geschwentner, Rohrmoos, Germany, assignor to Motoren-Und Turbinen-Union Munich G.m.b.H., Munich, Germany**

**Filed Aug. 13, 1969, Ser. No. 849,681**
**Claims priority, application Germany, Aug. 14, 1968, P 17 51 899.7**
**Int. Cl. F02k** *9/04, 9/06*
**U.S. Cl. 60—250** **9 Claims**



A solid-fuel rocket in which at least three propellants with different combustion rates and of either spherical or ellipsoidal shape are used, which are arranged either concentrically or eccentrically to a center point of the rocket.

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**3,585,800**

## TRANSPIRATION-COOLED DEVICES

**Robert J. Kuntz, Rancho Cordova; Albert L. Blubaugh, Sacramento; Richard J. Labotz, Fair Oaks, and Charles B. McGough, Fair Oaks, all of, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.**

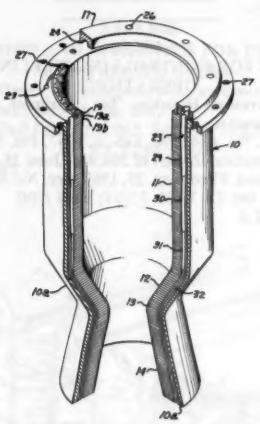
**Filed July 27, 1967, Ser. No. 656,522**
**Int. Cl. F02k** *11/02;* **B64d** *33/08*
**U.S. Cl. 60—265** **10 Claims**

This invention relates to transpiration cooling and particularly to transpiration cooling of devices subjected to heat flux above the capabilities of the material forming the device, such as thrust chambers for rockets.

According to the present invention, a device to be cooled by transpiration cooling has a wall constructed of a plurality of discrete wafers, each having planar surfaces and edge surfaces. A controlled pattern of flow passages is formed on one or both planar surfaces of each wafer, each flow passage terminating at an end surface of the wafer. The wafers are

joined together in a stack to form a unitary structure. The passage terminating edge surfaces together form the wall surface of the device, and the wall surface resembles a porous wall. The wafers are thin enough to give excellent wafer-to-coolant heat transfer area.

Transpiration cooling is accomplished by permitting coolant to flow through the passages in such a manner that heat input into the wall of the device is efficiently transferred to the coolant within the wall. This enables the coolant to reach



the maximum limiting temperature of the wall material before it is introduced onto the wall surface, thus fully exploiting the cooling capacity of the coolant.

According to an optional but desirable feature of this invention, the flow passages in the wafers are divided into discrete groups, thereby allowing isolation of areas where coolant boiling might occur. Restrictor passages are provided to each group of passages so that the flow resistance into each group of passages is independent of the heat transfer on the surface of the device.

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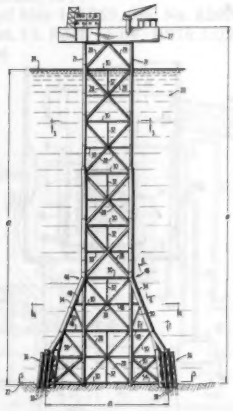
**3,585,801**
**OFFSHORE TOWER**
**Albert M. Koehler, Houston, Tex., assignor to Brown & Root, Inc.**
**Filed Feb. 20, 1970, Ser. No. 13,122**
**Int. Cl. E02b *17/00*; E02d *21/00***
**U.S. Cl. 61—46.5** **12 Claims**



A tower suitable for use in offshore well operations and the like and including a plurality of generally vertical columns extending from the bed of a body of water to a position above the surface of the body of water for supporting a platform thereupon. A quaternary batter brace system is connected to the generally vertical columns in a position intermediate the ends of the columns and beneath the surface of the body of water. Piling jacket clusters are connected to the free end of each of the batter brace members and are designed to rest upon the bed of the body of water. A plurality of piles extend through the batter piling jacket clusters and pin the offshore tower to the bed of the body of water. A reinforcing lattice connects adjacent batter brace members and pile jacket clusters solely on opposite sides of the vertical columns. The region between alternate batter braces and pile jacket clusters on opposite sides of the vertical columns are free of inner connecting reinforcing structure.

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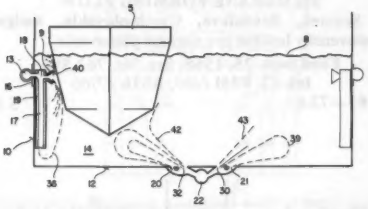
**3,585,802**
**DOCKING AND FENDERING SYSTEM**
**Ernst G. Frankel, Boston, Mass., assignor to Litton Systems, Inc., Beverly Hills, Calif.**
**Filed July 16, 1969, Ser. No. 842,172**
**Int. Cl. E02b *3/20, 15/02, 3/00***
**U.S. Cl. 61—48** **7 Claims**



A docking and fendering system for aiding in the directional guidance and fendering of vessels in channels, wells or along piers. Guidance of the vessel is achieved by hydraulic or pneumatic submerged jets directed against the sides of the vessel to direct or fender the vessel. The jets can be entirely water, air, or a mixture and are located along the wall or pier from which the vessel is to be fendered and submerged at a distance outboard from the dock so as to provide a lateral thrust on the vessel.

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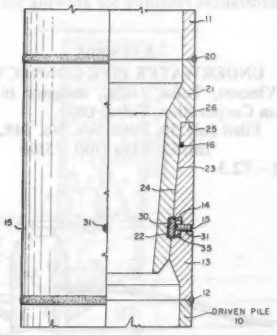
**3,585,803**
**PILE SPLICE**
**John J. Bardgette, Orleans Parish, La., assignor to Esso Production Research Company**
**Filed Nov. 15, 1968, Ser. No. 776,013**
**Int. Cl. E02d *5/52*; F16l *21/00***
**U.S. Cl. 61—53** **5 Claims**




A machined pile splice for use in construction of offshore platforms. A box member is attached to a pile member be-

fore it is driven. A pin member is attached to the pile section to be added. A shear ring is located in opposing recesses in both the box and pin members. The shear ring is made slightly wedge-shaped in cross section and is initially installed in the box member where it is held centered by a corrugated spring strip. The box member is also provided with thread studs which force the shear ring into tight contact with the lower surface of the pin member recess and upper surface of the box member recess. The outer surface of the pin member and the inner surface of the box member are tapered. The tip of the pin member passes through the shear ring and outer wall of the pin member contacts the inner wall of the shear ring. As the tapered pin member continues through the shear ring, the ring is forced to increase in diameter which forces the ring deeper into the box member recess. After the pin member is fully inserted into the box member, the shear ring snaps out of the box member and into the opposing pin member recess. The thread studs are screwed in, forcing the wedge-shaped shear ring into tighter contact with the lower surface of the pin member recess and the upper surface of the box member recess. An O-ring is provided between the pin and box members to provide a fluid seal.

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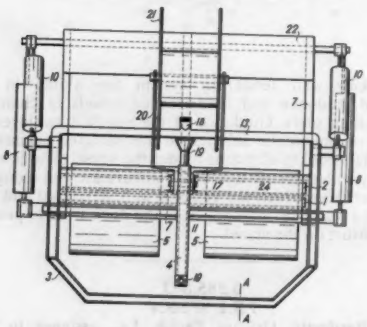
**3,585,804**
**MEMBRANE-FORMING PLOW**
**Martin Sramek, Bratislava, Czechoslovakia, assignor to Ceskoslovensky institut pre uzemne planovanie**
**Filed Sept. 25, 1968, Ser. No. 762,586**
**Int. Cl. F16l *1/00*; A01b *17/00***
**U.S. Cl. 61—72.6** **5 Claims**



Underground ditches with impermeable walls are created in deep sands of arid areas by means of a plough, adapted to dig a ditch. The walls of said ditch are sprayed with a material which makes it impermeable and deposits into said ditch irrigating conduits capable of supplying water or solutions of nutritious substances required for growing plants.

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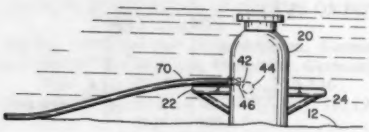
**3,585,805**
**UNDERWATER PIPE CONNECTOR**
**Renic P. Vincent, Tulsa, Okla., assignor to Pan American Petroleum Corporation, Tulsa, Okla.**
**Filed July 30, 1968, Ser. No. 748,804**
**Int. Cl. F16l *1/00*, *35/00***
**U.S. Cl. 61—72.3** **11 Claims**



A pipe connector for connecting pipe together. In a preferred embodiment, the receptacle of the connector is mounted in the wall of a watertight underwater cellar and is provided with a cap on the interior of the cellar. A cable runs through this cap to a winch. The other end of the cable is connected to a pipeline lead plug which, when pulled into the receptacle, makes a sealing fit with its interior. The lead plug is connected to a pipeline lying on the ocean floor. Special stepped design of the receptacle and the plug prevents misalignment as the plug is pulled into the receptacle. A support ring surrounds the underwater cellar just below the receptacle for aiding in relieving the strain on the lead plug as it enters the receptacle.

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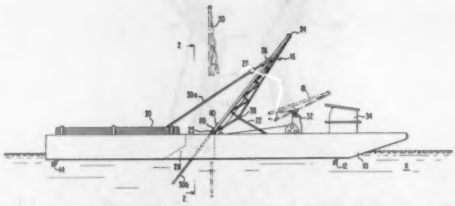
**3,585,806**
**APPARATUS FOR CONTROLLING PIPELINE LAYING OPERATIONS**
**Joseph B. Lawrence, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.**
**Division of Ser. No. 614, 290, Feb. 6, 1967, Pat. No. 3,472,034, and a continuation-in-part of 204,915, June 25, 1962, now abandoned. Filed Aug. 25, 1969, Ser. No. 852,865**
**Int. Cl. B63b *35/04*; F16l *1/00***
**U.S. Cl. 61—72.3** **4 Claims**



Apparatus for laying elongate flexible means on submerged surfaces wherein control over the laying operation is maintained in accordance with measured changes in force imposed on the elongate flexible means in response to the lengthening of the pipeline from the lay vessel or movement of the lay vessel.

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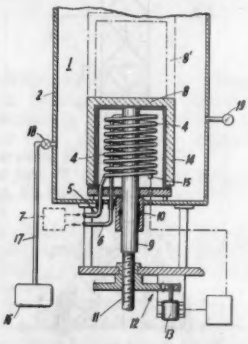
**3,585,807**
**METHOD OF AND APPARATUS FOR PUMPING GAS UNDER CRYOGENIC CONDITIONS**
**Jurgen Hengevoss, and Hermann Wossner, both of Balzers, Liechtenstein, assignors to Balzers Patent-und Beteiligungs-Aktiengesellschaft, Balzers, Liechtenstein**
**Filed Aug. 18, 1969, Ser. No. 850,755**
**Claims priority, application Switzerland, Aug. 20, 1968, 12,651/68**
**Int. Cl. B01d *5/00***
**U.S. Cl. 62—55.5** **13 Claims**



In pumping a gas under cryogenic conditions, condensation surfaces disposed within a receiver containing the gas to

be pumped are cooled to a predetermined temperature while the surfaces are thermally insulated from any heat within the receiver. During initial cooling the gas is not permitted to flow over the condensation surfaces. When the predetermined temperature is reached, the gas within the receiver, which is under vacuum conditions, is circulated over the condensation surfaces. The amount of gas flowing over the condensation surfaces is regulated in accordance with the temperature, vacuum and other conditions within the receiver.

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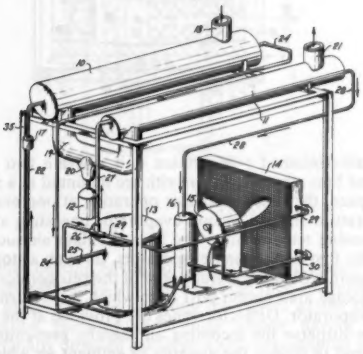
**3,585,808**

## METHOD AND APPARATUS FOR DRYING COMPRESSED GASES

**Lowell E. Huffman, Wilmington, Del., assignor to Deltech Engineering, Inc., New Castle, Del.**

**Filed Feb. 17, 1969, Ser. No. 799,563**
**Int. Cl. F25d** *17/06*
**U.S. Cl. 62—93** **11 Claims**



Compressed gases are dried by heat exchanging them with a refrigerating fluid in a closed refrigeration circuit. The chilled gases are then reheated to use temperature by being heat exchanged with condensing refrigerating fluid. The refrigerating fluid is also heat exchanged with ambient air in a condenser connected in parallel or in series with the compressed gas reheater. Color indicating means may be used in conjunction with the reheater for indicating product gas humidity and dryer performance.

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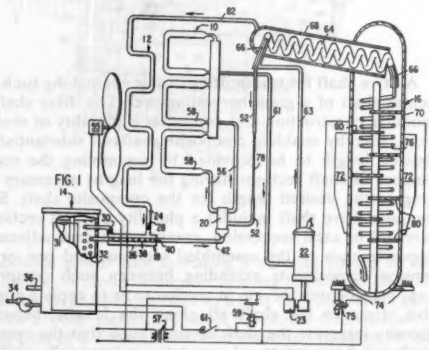
**3,585,809**

## ABSORPTION REFRIGERATION MACHINE

**Earl L. Brown, Brownsburg, Ind., assignor to Carrier Corporation, Syracuse, N.Y.**

**Filed May 1, 1969, Ser. No. 820,938**
**Int. Cl. F25b** *15/04;* **H01h** *35/24*
**U.S. Cl. 62—126** **4 Claims**




An aqua-ammonia absorption refrigeration system employing an ammonia sensor in the chilled water circuit to detect the presence of ammonia therein and shut down the system to prevent serious corrosion of the chilled water circuit by ammonia.

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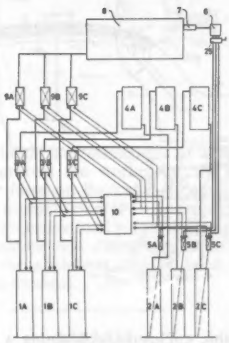
**3,585,810**

## INTERMITTENT ABSORPTION REFRIGERATING MACHINE

**Ernst Sander, Stuttgart-Vaihingen, and Franz Millay, Dettenhausen, both of, Germany, assignors to G.u.E. Zimmermann, Dettenhausen, Germany**

**Filed July 3, 1969, Ser. No. 838,773**
**Claims priority, application Austria, July 15, 1968, A6811/68**
**Int. Cl. F25b** *17/04*
**U.S. Cl. 62—144** **14 Claims**



A refrigeration system is equipped with at least two absorbers, a heater for regenerating the absorbent material in each absorber, a condenser and collector vessel associated with each absorber, and a common evaporator. Valves connect the absorbers, condensers, collectors, and the evaporator, and are interlocked with each other and the switches for the electrically operated heaters to permit three modes of operation. In the first mode, the absorbers are cyclically and alternatingly discharged to provide refrigeration and heated for regeneration. In the second mode, all absorbers are being discharged simultaneously, and they are being regenerated simultaneously in the third mode. The necessary actuating system is set by shifting a single control member.

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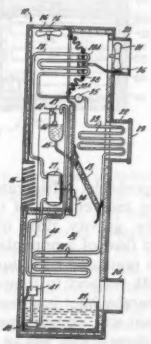
**3,585,811**

## AIR CONDITIONED STORAGE SYSTEM

**Murray Friedel, North Miami Beach, Fla., assignor to Visual Graphics Corporation, New York, N.Y.**

**Filed Dec. 23, 1969, Ser. No. 887,712**
**Int. Cl. F25b** *29/00*
**U.S. Cl. 62—173** **10 Claims**



A storage system comprising dual compartments in which materials requiring temperature and humidity control are

stored. The double compartments with different locks include a system of inventory control as well as stock rotation. The compartment which is filled first is used first and, when empty, an order for replacement stock is made. Both compartments are controlled to stabilize temperature and humidity by a single control unit which is a separable unit.

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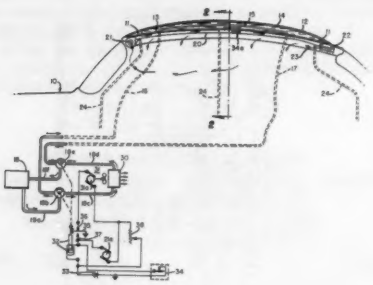
**3,585,812**
**VEHICLE AIR CONDITIONING SYSTEM**
**Louis W. Parker, Parker Electronics Inc., 2040 N. Dixie Hwy., Fort Lauderdale, Fla. 33305**
**Filed Jan. 27, 1970, Ser. No. 6,178**
**Int. Cl. F25d** *17/00*
**U.S. Cl. 62—180** **10 Claims**



An expansible enclosure, containing a freezable liquid, is disposed across the exterior metal top of a vehicle. Freon lines extend from a conventional air conditioning unit, located within the vehicle, through the freezable liquid for freezing the liquid within said container during operation of said unit. An automatic control system controls freon flow through the conventional air conditioning unit and through said freezable liquid, and also controls operation of a fan motor associated with the conventional unit and a blower unit associated with the freezable liquid portion of the system.

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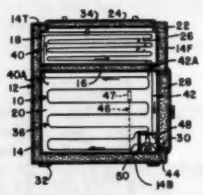
**3,585,813**
**SELF-CONTAINED PORTABLE COOLER**
**Charles C. Hansen, Hinsdale, and Harold J. Lonn, Lombard, both of, Ill., assignors to Refrigerating Specialties Company, Broadview, Ill.**
**Filed Mar. 28, 1969, Ser. No. 811,316**
**Int. Cl. F25b** *41/04*; **G05d** *27/00*
**U.S. Cl. 62—223** **22 Claims**



A self-contained, portable, refrigerated shipping container in which the working temperature of the shipping compartment is provided by gravity flow of a volatile liquified refrigerant, or forced flow of a nonvolatile liquid refrigerant, in a closed circuit as regulated by a liquid flow control valve that is controlled with respect to temperature or refrigerant pressure changes whereby heat is removed from the working compartment to a heat sink compartment that is chilled by a fluid or solid stored therein that has an effective temperature below that of the working compartment. Preferably the valve for purposes of miniaturization and great sensitivity has a sinuous land of substantial length defining a port area whose major dimension is fractionally less than the diameter of a circle whose circumference has the same length.

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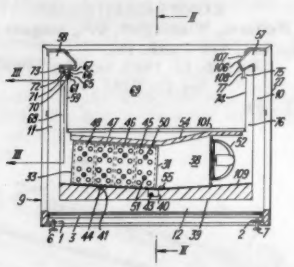
**3,585,814**
**REFRIGERATED UNIT**
**Gabriel Van Cauwenberge, Geel, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.**
**Filed Sept. 19, 1968, Ser. No. 773,685**
**Claims priority, application Belgium, Sept. 29, 1967, 704,470**
**Int. Cl. F25d** *11/00*
**U.S. Cl. 62—255** **5 Claims**



A self-contained refrigeration unit wherein two evaporators and fans associated therewith are mounted in a refrigeration space, the first evaporator operating at one evaporating temperature and the second evaporator operating at a lower evaporating temperature. The fans circulate air successively over the first and second evaporators, through a storage area input port, within the storage area of the refrigerator unit and to a storage area output port from which it is returned to the first evaporator. Deflector vanes are provided at the air input port to disperse the incoming air thereby preventing turbulence and to reduce the quantity of ambient air which enters the output port which is located at the side of the storage area opposite the side where the input port is located.

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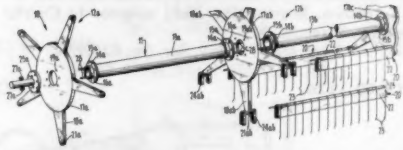
**3,585,815**
**MODULAR DRIVE SHAFT**
**Stephen R. Hubbard, Stockton, Calif., assignor to Universal Harvester Co., Stockton, Calif.**
**Filed Mar. 14, 1969, Ser. No. 807,276**
**Int. Cl. F16c** *1/00*
**U.S. Cl. 64—1** **7 Claims**

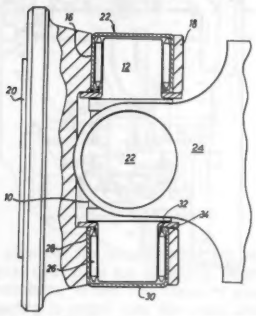


A drive shaft for transmitting torque therealong such as the center shaft of a grain harvesting reel. The drive shaft is of modular construction and comprises a plurality of shaft sections, thereby enabling composite shafts of substantially any desired length to be provided by assembling the requisite number of shaft sections having the lengths necessary to aggregate the desired length for the composite shaft. Such a modular drive shaft includes a plurality of shaft sections assembled in axial succession, compression caps adjacent the opposite ends of the assembled sections, and one or more tension components extending between such compression caps and secured thereto in tension so as to apply a compressive stress to the shaft all along the length thereof and thereby integrate the shaft sections such that the composite shaft will have structural properties substantially equivalent to those of a one-piece shaft of the same length and general parameters.

## 3,585,816
## NEEDLE BEARING ESPECIALLY FOR UNIVERSAL JOINTS

Robert S. Batt, Barby, near Rugby, England, assignor to The Torrington Company Limited, Coventry, England

Filed July 22, 1969, Ser. No. 843,319
Claims priority, application Great Britain, July 26, 1968, 35,696/68
Int. Cl. F16d 3/26
U.S. Cl. 64—17A 1 Claim

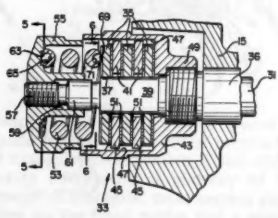


In a roller bearing having an outer race, a plurality of rollers distributed around the interior of the race and a flange at one end of the race for retaining the rollers axially therein, the invention provides an annular washer having axially spaced, radially directed portions which are adapted to snap over the race flange to hold the washer on the race, an axial washer portion lying between the radial portion thereof then acting to retain the rollers radially within the said end of the race.

## 3,585,817
## ADJUSTABLE CLUTCH CONSTRUCTION

Leo A. McCafferty, Jr., Baltimore, and Robert G. Moores, Jr., Towson, both of, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Aug. 19, 1969, Ser. No. 851,374
Int. Cl. F16d 7/02; F16b 39/28
U.S. Cl. 64—30C 12 Claims

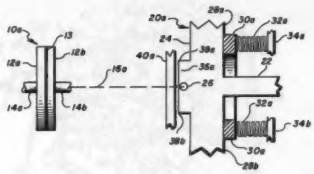


A portable power tool including a housing having an integral handle. A motor within the housing imparts rotation or longitudinal percussion or both to a tool bit which is engageable with a work surface. A novel adjustable friction clutch forming part of a drive train which transmits rotation to the bit, interconnects two shafts to transmit rotary movement therebetween but allows one shaft to slip relative to the other such as when the bit becomes frozen in the work.

## 3,585,818
## OVERRIDING CLUTCH

Dean R. Helble, Hawthorne, Calif., assignor to North American Rockwell Corporation

Filed Nov. 10, 1969, Ser. No. 875,010
Int. Cl. F16d 7/02
U.S. Cl. 64—30R 8 Claims

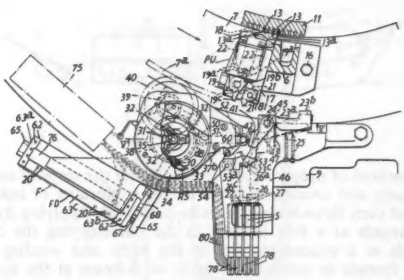


An overriding clutch that disengages at a predetermined load in order to protect the workpiece, the tool, the apparatus, and/or the fastener. Basically, it comprises a toggle-element that, in its normal orientation, assures that the clutch is engaged; but an excessive load pivots the toggle-element to an abnormal orientation that disengages the clutch. Due to design symmetry, the apparatus may be used for both forward and backward motions.

## 3,585,819
## PATTERNING MECHANISM FOR CIRCULAR KNITTING MACHINES

Ernest L. Farmer, Leicester, and Bertram Johnson, Braunstone, both of, England, assignors to Wildt Mellor Bromley Limited, Leicester, England

Filed July 29, 1968, Ser. No. 748,480
Claims priority, application Great Britain, Aug. 4, 1967, 35804/67
Int. Cl. D04b 15/78
U.S. Cl. 66—50 7 Claims



A circular knitting machine with stationary needle cylinder and revolving cam box is equipped with patterning units which rotate with the cam box and each comprises needle selector members and actuators therefor. Solenoids at stationary location selectively operate the actuators. Electronic switches control solenoid energization. Photoelectric cells, selectively influenced by an intermittently movable control film, dictate selective preconditioning (opening) of electronic switches in readiness for closure of same to pulse selected solenoids. A timer closes preconditioned switches for a preset time so energizing the solenoids for the same time. A reed switch operable in time with the cam box controls the timer.

3,585,820

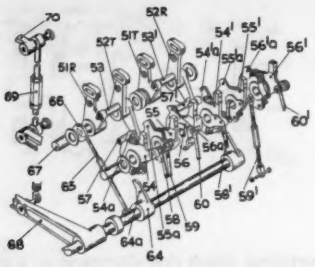
## STRAIGHT BAR KNITTING MACHINES

Ernest Start, Ruddington, and Raymond Blook, Loughborough, both of, England, assignors to William Cotton Limited

Continuation of application Ser. No. 708,833, Feb. 28, 1968. This application Dec. 9, 1969, Ser. No. 880,472

Int. Cl. D04b 15/04

U.S. Cl. 66—96 8 Claims



A method of cable stitching on a straight bar-knitting machine by use of a narrowing head having two rods one of which carries one, or two, loop transfer points, the other of which carries a masking blade or a loop transfer point, with cam or solenoid means controlling the masking blade or point on the second rod, adjustable lead screw means for sideways adjusting the first or both rods, oppositely operable ratchet mechanism for the lead screw mechanism, and selector disc control means operable by solenoids for selectively controlling the ratchet means, or solenoids being under control of selection control means such as electric program and chart reader means.

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3,585,821

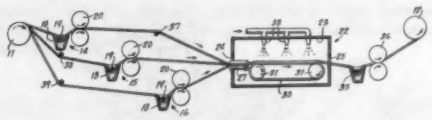
## APPARATUS FOR PREPARING DYED TEXTILE WARPS

Warren E. Beltramini, 96 Dimmig Road, Upper Saddle River, N.J.

Filed Nov. 5, 1968, Ser. No. 773,573

Int. Cl. B05c 3/138; D06c 1/06

U.S. Cl. 68—19.1 2 Claims



A method of preparing a warp including the steps of simultaneously and continuously advancing a plurality of initially undyed yarn threads along a finite path while applying dye to the threads at a first locality in the path, drying the dyed threads at a second locality in the path, and winding the dried threads in side-by-side array on a beam at the end of the path. To produce a multicolor warp, dyes of selected different colors are applied to selected different threads at the first locality, the threads to be dyed each of the colors being selected so as to provide a desired sequence of threads of different colors on the beam; as the threads are advanced from the first locality to and through the second locality, threads dyed each of the colors are kept away from contact with threads dyed each other color. Apparatus for preparing a dyed warp comprising means for simultaneously and continuously advancing a plurality of threads along a defined path, including means for winding the threads in side-by-side array on a beam at the path terminus; at least one dyeing station including a dye trough through which the threads pass at a first locality in the path, and a pair of rollers for expressing excess dye from the threads emerging from the trough; and a confined drying chamber through which the dyed threads pass, in exposure to a heated drying atmosphere, before being wound on the beam.

3,585,822

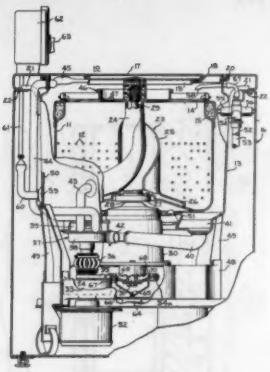
## PROPULSION SYSTEM FOR AUTOMATIC WASHER

Joseph C. Worst, Louisville, Ky., assignor to General Electric Company

Filed Feb. 5, 1970, Ser. No. 8,899

Int. Cl. D06f 33/02, 37/40; F16d 27/00

U.S. Cl. 68—23.7 4 Claims



A tachometer generator is connected to the driven input member of the transmission of an automatic washer. The generator provides a signal to a control circuit which is adapted to vary the current through the coil of an electromagnetic clutch, thus varying the torque transmitted from the clutch input to the clutch output. A drive means having a potential for slippage couples the clutch output to the driven input member of the transmission. Slippage within the drive means is compensated for by the generator delivering to the control circuit a signal which will cause the clutch to increase the torque transmitted to the clutch output.

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3,585,823

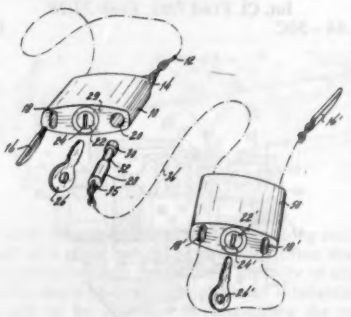
## CHAIN LOCK

Alice R. Nagel, 68-01 60th Road, Maspeth, N.Y.

Filed July 16, 1969, Ser. No. 842,206

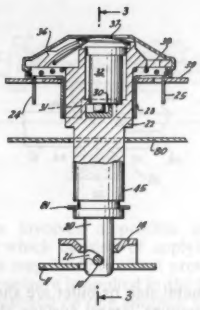
Int. Cl. E05b 67/18, 67/24

U.S. Cl. 70—49 3 Claims



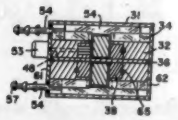
A chain lock of the type embodying an encircling chain and a lock housing secured at one end of said chain, the lock housing including a chain passage and a lock tumbler rotatable in the housing, so as to throw a locking bolt through the chain passage and the chain supported in the passage. The housing may also include an additional leash end plug aperture and an additional locking bolt, so as to lock an additional chain into the housing.

3,585,824
FASTENER ASSEMBLY
Peter Schenk, West Islip, N.Y., assignor to Dzus Fastener Co., Inc., Islip, N.Y.
Filed Mar. 21, 1969, Ser. No. 809,195
Int. Cl. B65d 55/14; A44b 17/00; E05b 65/12
U.S. Cl. 70—168 10 Claims



A fastener element for joining separate members is provided with spiral cam slots for engaging a spring attached to one of the members. When the fastener element is axially rotated, the spring is urged into the cam slots to fasten the spring and element together. The fastener element is provided with locking means to prevent axial rotation. Means are also provided, either in combination with the locking means or only with the fastener element, to adjust the length of the fastener element to accommodate the distance between the members to be fastened. This mechanism dispenses, in many instances, with the need to inventory fastening elements of varying lengths.

3,585,825
COMBINATION LOCK
John Charles Windle, R.D. #1, Box 214, Honebrook, Pa.
Filed Nov. 20, 1969, Ser. No. 878,360
Int. Cl. E05b 37/16
U.S. Cl. 70—298 12 Claims

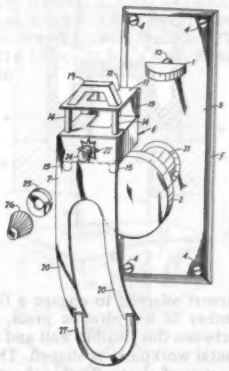


A combination lock having a pair of spaced fixed guides, each fixed guide having a plurality of longitudinally spaced guideways of triangular cross section, a bolt slidable between the fixed guides and having a plurality of longitudinally spaced guideways of triangular cross section capable of aligning with those on the fixed guides and a plurality of combination pins in the guideways of the fixed guides, each combination pin having at a particular position conforming to the combination a transverse notch to permit the bolt to operate. In one embodiment the combination pins are spring biased and adjusted to set the combination. In another embodiment the bolt may be longitudinally separated into two parts temporarily discarding part of the combination, or the two parts of the bolt can be interconnected to require that both combinations operate. In another variant of the invention the lock is capable of being opened by a master combination or an individual combination.

3,585,826
PIVOTED TUMBLER LOCK CONSTRUCTION
Leonard Mercurio, 34 Beaumont Drive, and Anthony R. Morello, 26 Kalda Lane, both of Plainview, N.Y. 11803
Filed Jan. 9, 1970, Ser. No. 1,606
Int. Cl. E05b 29/02
U.S. Cl. 70—366 3 Claims

A pivoted tumbler-type lock construction in which the tumblers are mounted upon the rotating cylinder for movement about a very small arc about an axis parallel to the axis of rotation of the cylinder. The tumblers are pivoted upon one of three pintles, each angularly spaced 120° apart from the remaining two, and are actuated by one blade of a three-bladed key, the blades of which are also angularly spaced 120° apart and positioned medially of a pair of said pintles when inserted into the cylinder. Each of the tumblers includes two ends disposed on either side of the mounting pintle, which are alternately engageable within locking recesses in a relatively fixed housing, insertion of the key serving to contact one of the ends to move the tumbler within the cylinder, the other of the blades serving to accurately fix this position. The tumblers are mounted on individual plates comprising the cylinder, and are spaced 120° apart from each other, so that each tumbler is actuated by a pair of adjacent blades on the key.

3,585,827
SECURITY LOCK
Domingo Dominguez, 220 E. 54th St., New York, N.Y. 10022
Filed Mar. 5, 1970, Ser. No. 16,717
Int. Cl. E05b 13/00
U.S. Cl. 70—416 15 Claims



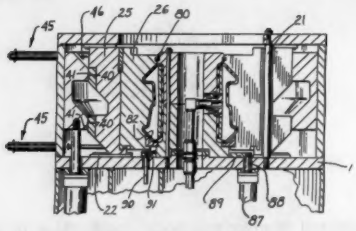
The present invention provides a security lock for door locks which includes a knob member. A casing, preferably including a spring-biased cover is adapted to accept the knob portion of the lock therein with the casing secured in fixed position by an elongated portion extending from the casing which is firmly emplaced. The present invention further includes adjustment means so that the orientation of the casing and the securing portion can be adapted for use with locks having knobs of different locked positions and arrangements where the door handle and knob member are at various orientations to each other.

3,585,828

## BLADDER EXPANDER AND CASKET PRODUCT

Ralph E. Roper, Indianapolis, Ind., assignor to Wallace Expanding Machines, Inc., Indianapolis, Ind.

Filed Sept. 5, 1968, Ser. No. 757,541
Int. Cl. B21d 22/12
U.S. Cl. 72—63 5 Claims



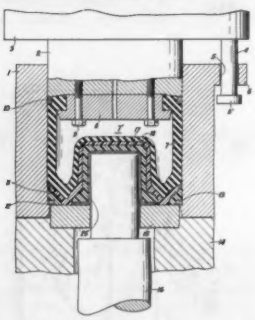
An expander for forming a drawn metal product such as a casket and the like. The expander includes a bladder which surrounds a ring. Hydraulic fluid is pumped into the bladder to cause the bladder to expand and force the workpiece against a rigid outer die, the hydraulic fluid being conveyed by a conduit which extends through the bladder and ring and is fixed to the ring. The above mentioned caskets have a one-piece single-seam construction for their sidewalls.

3,585,829

## PROTECTIVE INSERT FOR HYDRAULIC PRESSES AND ARTICLE AND METHOD USED IN THE MANUFACTURE THEREOF

Jaroslav Hurek, Prague, and Miroslav Hronovsky, Nachod, both of, Czechoslovakia, assignors to Ustav pro vyzkum motorovych vozidel, Prague, Czechoslovakia

Filed Jan. 21, 1969, Ser. No. 792,333
Int. Cl. B21d 22/12
U.S. Cl. 72—63 2 Claims



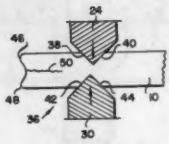
A protective insert adapted to engage a flexible wall of a pressurized chamber of a hydraulic press, with the insert being situated between this flexible wall and a punch around which a sheet metal workpiece is shaped. The protective insert has at least a pair of elastic flexible sheets firmly fixed to each other at a central region thereof, these sheets having portions surrounding their central connected portions and separated from each other, for instance, by a layer of lubricant. The central region holds the sheets together in the required relationship one with respect to the other. During the manufacture of the insert there is initially located between the sheets of the insert a metallic separator formed with a central opening through which the central portions of the elastic sheets are united as by being vulcanized to each other. Then one of these sheets is cut through at the region of the periphery of the separator so that the latter can then be removed.

3,585,830

## METHOD OF AND APPARATUS FOR SHEARING AND ROLLING METAL BILLETS

Randolph N. Mitchell, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Sept. 6, 1968, Ser. No. 757,915
Int. Cl. B21b 1/00
U.S. Cl. 72—203 5 Claims



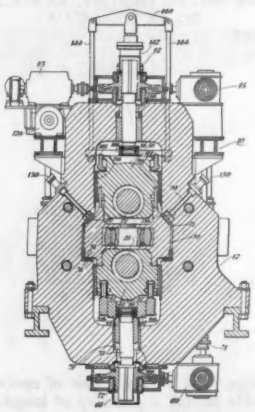
The ends of a metal slab or billet are sheared so as to impart a V-shaped convex lateral surface thereto. The shear blades are pressed into the metal in a pinching motion until the remaining uncut portion fractures and breaks through. The blades are slightly offset with respect to each other whereby the blades are not flattened when they reach the end of their stroke.

3,585,831

## ROLLING MILL STRUCTURE AND ROLL CHANGING MEANS THEREFOR

Herbert Lemper, Pittsburgh, Pa., assignor to Mesta Machine Company, Pittsburgh, Pa.

Filed Apr. 3, 1969, Ser. No. 813,059
Int. Cl. B21b 31/08
U.S. Cl. 72—239 10 Claims

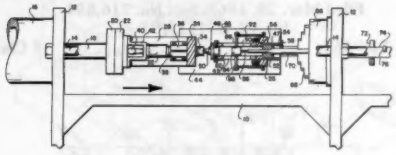


A rolling mill structure comprising a roll assembly insertable through a mill housing window. A roll housing carrying a roll is movable toward and away from another roll forming part of the roll assembly. A plunger is longitudinally movable along an inclined passageway intersecting the path of movement of the roll housing, and is inserted into a complementary recess in the housing to establish a predetermined roll gap. The plunger can be withdrawn from the housing and out of the path of the assembly without removal of the plunger from the mill housing.

## 3,585,832
## METAL WORKING

**John Wesley Hinshaw, Garden Grove, and William Clyde Doheney, Torrance, both of, Calif., assignors to The Battelle Development Corporation, Columbus, Ohio**

**Filed June 14, 1968, Ser. No. 737,062**
**Int. Cl. B21c** *23/00, 1/26;* **B25d** *9/00*
**U.S. Cl. 72—256** **17 Claims**

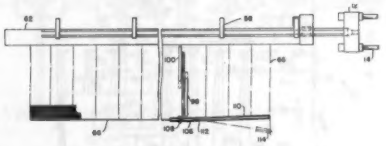


This invention involves a process and apparatus for deforming metal which consists of applying pressure to the metal surface of a magnitude to effect preselected directional metal flow. The pressure is applied in the form of dual working forces superimposed on one another. One of the working forces consists of a relatively steady continuous force while the other is pulsating. A preferred apparatus of the present invention consists of a die axially mounted relative to an elongated workpiece and free to move a limited distance along this axis. Parallel dual working means, one being disposed to provide a relatively steady working force and one being disposed to provide a pulsating working force are mounted to drive said die over said workpiece or said workpiece through said die. Other embodiments of the present invention include an apparatus and method for stamping and deep drawing sheet or strip metal with a die by utilizing parallel dual steady and pulsating working forces.

## 3,585,833
## TUBE EXTRUSION PRESS RUNOUT APPARATUS

**Delbert V. Carraher; James L. Cunningham, both of Decatur, Ala., and Klaus K. Rieger, Bloomfield Hills, Mich., assignors to Universal Oil Products Company, Des Plaines, Ill.**

**Filed May 12, 1969, Ser. No. 823,873**
**Int. Cl. B21c** *23/00, 35/00;* **B21d** *45/00*
**U.S. Cl. 72—256** **15 Claims**



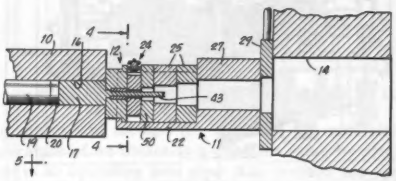
Tube extrusion press runout apparatus to eliminate or minimize oxidation, to straighten and quench the extruded tube to drain the tube and blow moisture therefrom, to insert a plug and lubricant into one end of the tube, to point the end, and to feed the pointed end of the tube to a die for reduction.

## 3,585,834
## VARIABLE OPENING DIE BOLSTER FOR EXTRUSION PRESS

**Jan Leon De Bruyn; Jakub Los; Charles Stanely Mitchell, and Harold Iner Wise, all of Kingston, Ontario, Canada, assignors to Alcon Research and Development Limited, Montreal, Quebec, Canada**

**Filed June 3, 1968, Ser. No. 733,886**
**Int. Cl. B21c** *25/08;* **B21j** *13/00*
**U.S. Cl. 72—260** **6 Claims**

In a press for effecting extrusion of metals such as aluminum, having an extrusion die carried by a tool container, there is provided a die-supporting bolster dimensioned to fit within the tool container in abutting relation to the outlet face of the die and including a pair of gates movable toward and away from each other transversely of the direction of extrusion to define an opening of variable size in register with the die aperture. The gates are supported in the bolster by suitable means for effecting such movement; as one example of gate-moving means, the gates may be threadedly mounted on a pair of rotatable rods which extend in the direction of gate movement on opposite sides of the gates and are journaled in a rigid frame portion of the bolster. In this embodiment, each rod bears two oppositely directed threaded portions respectively engaging the two gates so that rotation of the rods effects oppositely directed movement of the gates, the rods being interconnected for simultaneous rotary move-

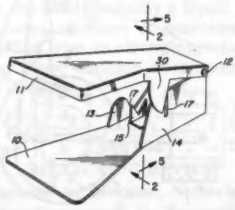


ment upon application of rotary drive to one of them by suitable means such as, for example, an external drive shaft. The bolster is used to support a compound die which includes a major die having an aperture and a minor die received in a recess in the major die to define a smaller aperture, for producing a stepped extrusion having a first portion of cross section formed by the minor die and a second portion of larger cross section formed by the major die. In such operation, the bolster gates are initially closed sufficiently to hold the minor die in place and are moved apart by rotation of the rods after the first portion of the extrusion has been formed to release the minor die while retaining the major die in position to form the second portion of the extrusion.

## 3,585,835
## HYPODERMIC SYRINGE AND NEEDLE DESTROYER

**Clyde H. Clement, 8439 N. 13th Place, Phoenix, Ariz.**

**Filed May 23, 1968, Ser. No. 731,446**
**Int. Cl. B21d** *28/00, 31/02, 43/28;* **B26d** *5/10, 7/00*
**U.S. Cl. 72—330** **4 Claims**



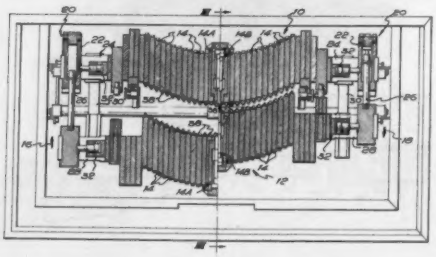
A hypodermic syringe destroyer utilizing a pair of jaws pivotally secured to each other which, when closed upon each other, puncture the syringe and deform the hypodermic needle. The syringe is punctured by a puncture blade forcing the syringe against a V-shaped support member while the hypodermic needle is supported in a slot and is bent by a needle-bending plate overlapping the slot.

3,585,836

## APPARATUS FOR HEAT SETTING METAL

James Arthur Tate; Hiram Reginald Butterworth, both of Leeds, England, and Geoffrey Bowes Tarbuck, deceased, late of Newton-le-Willows, England (by Esme Irene Tarbuck, legal representative), assignors to Henry Berry & Company, Limited, Leeds, England and British Railways Board, London, England

Filed Aug. 19, 1968, Ser. No. 754,529
Claims priority, application Great Britain, Aug. 24, 1967, 39,243/67
Int. Cl. B21d 7/16, 11/10
U.S. Cl. 72—384 5 Claims



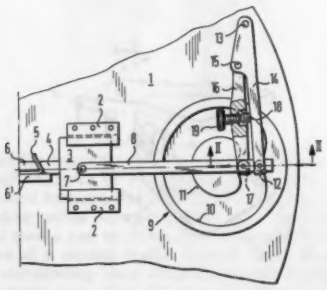
A method and apparatus for heat setting metal plate particularly, although not exclusively, for use in a leaf spring, in which a hot metal plate is bent to a predetermined shape between a pair of relatively movable dies, whereafter the plate and dies are moved together into a bath of quenching oil medium to heat set the metal in the predetermined shape. The dies each comprise a pack of relatively movable die plates which can be clamped together by fluid-operated means to prevent relative movement of the die plates while the hot plate is held in the dies. The dies are movable together while holding the hot metal plate in the predetermined shape towards and into a bath of quenching oil medium to heat set the plate in the predetermined shape and means are provided to circulate and cool the quenching oil medium.

3,585,837

## ENFORCED CAM GUIDANCE FOR TOOL CARRIERS

Otto Bihler, Halbech/Fuessen (Allgaeu), Germany

Filed Jan. 27, 1969, Ser. No. 794,331
Int. Cl. B21j 13/00
U.S. Cl. 72—452 10 Claims



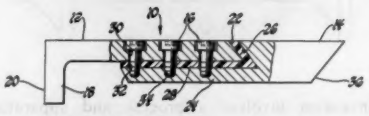
A positive cam drive arrangement for automatic processing machines wherein a tool carrier is mounted on a processing plate and a cam disc rotatably mounted on the plate carries a lead cam and a return cam. A connecting rod is pivotally attached adjacent one end thereof to the tool carrier. A followup arrangement is provided in which a lead cam follower rides against the lead cam and the return cam follower rides against the return cam, with one of the cam followers being biased into engagement with the associated one of the cams. A control lever extending substantially perpendicular to the connecting rod is pivotally attached to the connecting rod in order to minimize shearing forces.

3,585,838

## BUCKING BAR

Joseph M. Newlon, 635 N. Cass Lake Road, Pontiac, Mich.

Filed Mar. 28, 1968, Ser. No. 716,854
Int. Cl. B21j 13/02
U.S. Cl. 72—465 5 Claims



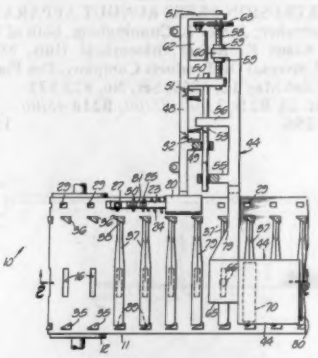
A work tool received behind work surfaces to provide a backing member in applying impact fasteners and including interfitted toolhead and handle parts with a low-recoil impact-absorbing spacer provided therebetween to take shock loads in compression and shear.

3,585,839

## METHOD AND APPARATUS FOR CALIBRATING THERMOMETERS AND THE LIKE

Stephen A. Bollinger, 1452 La Habra Dr., Lake San Marco, Calif. 92069

Filed July 26, 1968, Ser. No. 748,063
Int. Cl. G01k 15/00
U.S. Cl. 73—1 13 Claims



An apparatus and method for printing indicia on thermometers. The thermometers are maintained at a predetermined temperature and sequentially advanced to a station where the photoelectric means is employed to the position of the indicating fluid within the thermometer. In response to the determination the scale is printed on the tubular thermometer in the appropriate relationship.

3,585,840

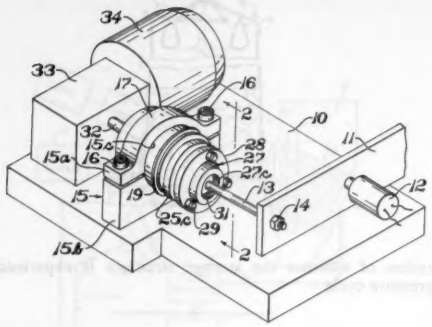
## FORCE GENERATOR

Clifford A. Landsness, Akron, Ohio, assignor to The B. F. Goodrich Company, NY, N.Y.

Filed Sept. 11, 1969, Ser. No. 857,064
Int. Cl. G01l 25/00
U.S. Cl. 73—1 6 Claims

An apparatus for generating a force of constant amplitude and changing direction for calibrating force-sensing instruments. A resilient rod with a bearing surface provided on the free end of the rod is anchored to the instrument to be

calibrated in cantilever arrangement. An eccentric is provided on one end of a shaft with the bearing surface of the




rod received therein and the end of the rod is orbitally oscillated by shaft rotation thereby providing a predetermined force input to the instrument.

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**3,585,841**

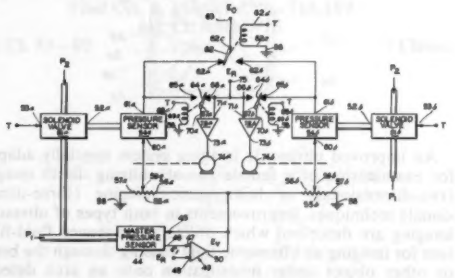
## SELF-CALIBRATING PRESSURE RATIO MEASUREMENT SYSTEM

**William E. Brandau, Westwood, and Anthony E. Napp, Woodcliff Lake, both of, N.J., assignors to The Bendix Corp.**

**Division of Ser. No. 778,188, Nov. 22, 1968, Pat. No. 3,548,662. Filed May 22, 1970, Ser. No. 39,818**

**Int. Cl. G01j** *27/00*

**U.S. Cl. 73—4** **8 Claims**




A strain gauge pressure-sensing means senses a first pressure and provides an excitation voltage inversely corresponding to the first pressure. The excitation voltage is applied through a pair of potentiometers to a pair of strain gauge pressure sensors for excitation of the sensors which alternately sense the first pressure and a second pressure through a pressure-switching means. The pressure sensors provide output signals corresponding to the sensed pressure and the excitation so that the signals therefrom correspond to the ratio of the first and second pressures when the second pressure is sensed and correspond to unity when the first pressure is sensed. A switching circuit connects the signal from the sensor sensing the first pressure to an amplifier which compares the signal with a unity reference signal and amplifiers any difference. The amplifier energizes a motor which drives a wiper of the potentiometer associated with the sensor sensing the first pressure to vary the excitation thereto so that the output therefrom corresponds to unity, whereby each sensor is alternately compensated for unstable characteristics and calibrated with the pressure sensing means.

**3,585,842**

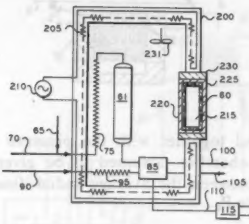
## METHOD AND APPARATUS FOR TEMPERATURE CONTROL

**Lewis B. Roof, Bartlesville, Okla., assignor to Phillips Petroleum Company**

**Filed May 12, 1969, Ser. No. 823,683**

**Int. Cl. G01n** *31/08*; **F28d** *15/00*

**U.S. Cl. 73—23.1** **2 Claims**




Apparatus and method are disclosed for maintaining the temperature of an object at a constant value by placing the object in an operating heat pipe. Also method and apparatus are disclosed for maintaining the temperature of an object in a heated chamber at a constant value by positioning a heat pipe so as to remove sufficient heat to maintain isothermal conditions in said chamber.

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**3,585,843**

## FLUID DENSITY TRANSDUCERS

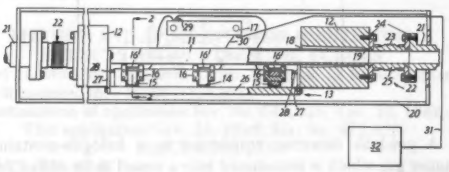
**James W. Stansfeld, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, England**

**Filed Oct. 22, 1969, Ser. No. 868,561**

**Claims priority, application Great Britain, Oct. 29, 1968, 51294/68**

**Int. Cl. G01n** *9/00*

**U.S. Cl. 73—32** **3 Claims**




A fluid density transducer in the form of a single tube electromagnetically excited into second or higher overtone transverse vibration, the fluid, normally a liquid, flowing through the tube. Resonant vibration is maintained by feedback through an amplifier from an electromagnetic pickup.

The frequency of the vibration is representative of the density of the fluid in the tube.

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**3,585,844**

## MEASURING DEVICE

**Josephus D. Dornseiffen, Zevenaar, Netherlands, assignor to Turmac Tobacco Company N. V., Zevenaar, Netherlands**

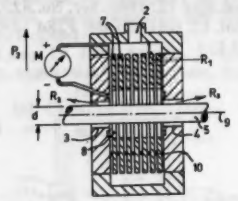
**Filed Sept. 3, 1969, Ser. No. 854,922**

**Int. Cl. G01b** *13/08*

**U.S. Cl. 73—37.7** **2 Claims**

A measuring device for measuring the average radial dimension of a string-shaped object is provided with a cylindrical chamber having a passage in its cylindrical wall and a central opening in each of its end walls. The object to be measured is passed through the chamber with gas at a constant pressure being applied to the chamber simultaneously. The chamber also contains a cylindrical body arranged

therein which leaves a space between it, the cylindrical wall and a central space as a passage for the object concentrically with the axis of the chamber. The central body serves as a



preresistance and together with the pressure flow characteristics of the chamber, assumed to be given, provides a linear relation between the average radial dimension $d$ and the basic pressure $P_2$.

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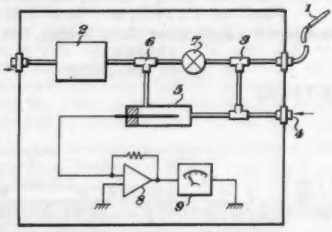
### 3,585,845
### GAS LEAK DETECTORS

**Richard C. Cornell, and Robert Gittins, both c/o Analytical Instruments Ltd., Fowlmere, Royston, Hertfordshire, England**

**Filed Nov. 4, 1968, Ser. No. 773,067**
**Claims priority, application Great Britain, Nov. 9, 1967, 51147/67**
**Int. Cl. G01m** *3/20*
**U.S. Cl. 73—40.7** **4 Claims**



A gas-leak detector, responsive to a halogen-containing tracer gas which is introduced into a vessel to be tested for a leak, comprising a probe through which air in the vicinity of a suspected leak may be drawn and diluted with an inert gas before being passed through an electron capture detector cell, the electric current through the cell serving to detect the presence of the tracer gas.

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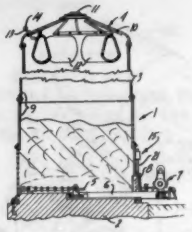
### 3,585,846
### INDICATING AND MONITORING MEANS FOR DETECTING CONDITION OF SEALED STORAGE STRUCTURES

**Leonard E. Broberg, Milwaukee, Wis., assignor to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.**

**Filed Oct. 10, 1968, Ser. No. 766,587**
**Int. Cl. G01m** *3/00*
**U.S. Cl. 73—52** **5 Claims**

For detecting the functioning of a sealed storage structure, a sealed housing is secured to the exterior of an airtight storage structure immediately above an entrance doorframe. A tube is interconnected to the bottom wall of the housing and the top cross member of the doorframe to provide communication between the interior of the storage structure and the housing. An inflatable monitoring bag is secured within the housing and connected by a vent tube to the exterior of the housing. The interior of the monitoring bag is subjected to the atmospheric pressure and the exterior of the bag is subjected to the structure pressure. The physical condition of the monitoring bag during any given period provides an indication of whether the storage structure is experiencing a pressure cycle.



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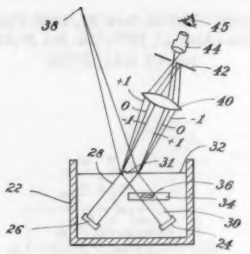
### 3,585,847
### ULTRASONIC IMAGING TECHNIQUES AND MAMMOGRAPH EQUIPMENT

**Byron B. Brenden, Richland, Wash., assignor to Holotron Corporation, Wilmington, Del.**

**Continuation-in-part of application Ser. No. 710,991, Mar. 6, 1968, now abandoned. This application May 20, 1968, Ser. No. 730,260**
**Int. Cl. G01n** *29/04*
**U.S. Cl. 73—67.6** **18 Claims**



An improved ultrasonic imaging system specially adapted for examination of a female breast utilizing direct imaging (two-dimensional) or holographic imaging (three-dimensional) techniques. Improvements in both types of ultrasonic imaging are described which utilize an improved fluid-filled lens for imaging an ultrasonic field passing through the breast or other object under investigation onto an area detector from which object information may be read out by light. Use of an ultrasonic lens in the reference beam of a holographic imaging system is also disclosed. A technique for holographic imaging wherein viewing optics are focused on the area detector directly instead of upon a focused image in space is also described with improved results under certain circumstances.

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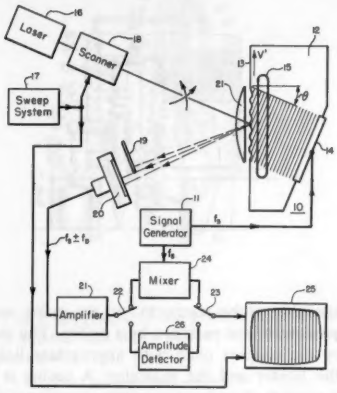
### 3,585,848
### METHOD AND APPARATUS FOR RECORDING ACOUSTIC IMAGES AND HOLOGRAMS

**Adrianus Korpel, Prospect Heights, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.**

**Filed Sept. 30, 1968, Ser. No. 763,676**
**Int. Cl. G01n** *29/04*
**U.S. Cl. 73—67.5** **5 Claims**

The object or specimen is irradiated with acoustic waves to develop a field of acoustic vibrations in a reflective surface, and a flying spot laser scanner is provided to scan the surface with a collimated light beam. Variations in a reflection component of the light from the surface are measured to develop an output signal having frequency variations which correspond with acoustic intensity variations in the plane of the

object surface. The output signal is heterodyned with a reference signal of a frequency bearing a predetermined relationship to that of the irradiating acoustic waves, and the resulting intermodulation product is converted to a visual-




type display to generate an acoustic hologram of the object. A conventional nonholographic acoustic image is obtained by amplitude detecting the output signal without reference signal mixing.

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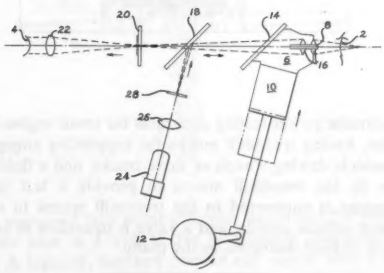
**3,585,849**

## METHOD AND APPARATUS FOR MEASURING INTRAOCULAR PRESSURE

**Bernard Grolman, Worcester, Mass., assignor to American Optical Corporation, Southbridge, Mass.**

**Filed Oct. 9, 1968, Ser. No. 766,189**
**Int. Cl. A61b** *3/16*
**U.S. Cl. 73—80** **7 Claims**



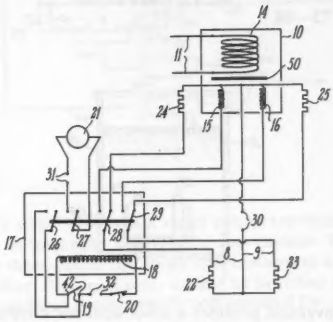
An air pulse is directed at the cornea of a patient's eye, causing it to deform from its normal convex shape through application and to a slight concavity. The intraocular pressure thereupon causes the return of the cornea from concavity through application to a normal or convex shape. The time interval between occurrences of application, or between a fixed point in time and either occurrence of application, is a measure of intraocular pressure. Apparatus for the practice of this invention includes an air pulse generator to provide a cornea-depressing pulse of air, a source of light and means to direct the same onto the corneal surface, a photodetection means to sense specularly reflected flux from the cornea, and instrumentation to show, as a function of time, the occurrences of reflected light flux maxima.

**3,585,850**

## DEVICE FOR COUNTING HEAT OR COLD UNITS

**Jean Topart, Colombes, France, assignor to Societe Pour La Mesure Des Calories "Somesca", La Garenne-Colombes, France, a part interest**

**Filed Jan. 23, 1969, Ser. No. 793,484**
**Claims priority, application France, Feb. 15, 1968, 139915**
**Int. Cl. G01n** *1/00*
**U.S. Cl. 73—193** **10 Claims**



Device for counting heat or cold units carried by a fluid and dissipated in a circuit passing through a heating or temperature-conditioning installation and comprising a fluid output meter. This device comprises an electric current meter, the inductor of which is energized by thermoelectric probe resistances immersed in the fluid at the inlet and outlet ends of the installation. The inductor of this electric current meter is energized only when a member adapted to deliver a current pulse each time the fluid output meter has performed a predetermined number of revolutions. The number of revolutions performed by the electric current meter is the product of its time of operation by the temperature difference between the thermoelectric probes.

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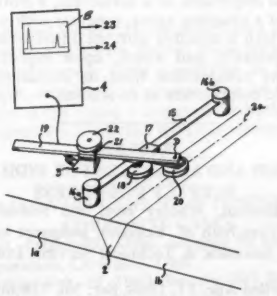
**3,585,851**

## METHOD AND APPARATUS FOR IDENTIFYING DEFECTS WITH ULTRASONIC ECHOES

**Karl G. Walther, Hamden, Conn., assignor to Krautkramer Ultrasonics, Inc., Stratford, Conn.**

**Continuation of application Ser. No. 546,423, Apr. 29, 1966. This application Nov. 24, 1969, Ser. No. 872,473**
**Int. Cl. G01n** *29/04*
**U.S. Cl. 73—67.8** **8 Claims**



A method and apparatus for ultrasonic fault testing using angled probe beams wherein the probes are mounted on movable guide bars thereby enabling the probes to be moved in any one, or all, of three dimensions. The movement of the probes is indicated by potentiometer output and recorded on a strip chart along with the reflected signals from the probes. The location of the flaw is derived by the ratio of voltages

representative of the distance between the probe and a reference axis and the distance travelled by the ultrasonic beam.

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**3,585,852**

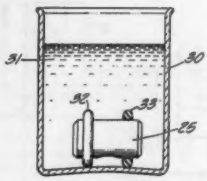
## STRESS EMBRITTLEMENT TESTING COUPONS

**Harley Eugene Bush, Houston, Tex., assignor to National Lead Company, New York, N.Y.**

**Division of Ser. No. 621,686, Mar. 8, 1967, Pat. No. 3,468,160. Filed Apr. 3, 1969, Ser. No. 813.037**

**Int. Cl. G01n** *17/00*

**U.S. Cl. 73—86** **4 Claims**




This invention provides a novel steel test coupon for rapid and highly reproducible testing of fluids for the determination of the liability to stress corrosion cracking and embrittlement for high-strength steels in the test fluid; and also provides a method for producing the test coupon in quantity, whereby slight variations in the stock used for the purposes of the test coupon are largely equalized out. The coupons are prepared by mutual compression at right angles of cylindrical bearing rollers, so as to produce high-stressed, generally circular depressions on the cylinder sides thereof.

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**3,585,853**

## METHOD OF REMOVING PENETRANT USED IN FLOW TESTING

**Christie S. Magdalin, Des Plaines, Ill., assignor to Magnaflux Corporation, Chicago, Ill.**

**Filed Apr. 4, 1967, Ser. No. 628,307**

**Int. Cl. G01n** *21/16*

**U.S. Cl. 73—104** **3 Claims**

An aerosol foam composition for removing excess of a dyed liquid penetrant, or penetrant residue, from a workpiece. The composition foams upon application to the surface and effects a superficial emulsification of any excess of penetrant, together with dye therein, without penetrating any surface discontinuity, so as to facilitate the wiping off of such excess without removing any penetrant entrapped in surface discontinuities. The composition is an aqueous solution, or homogeneous dispersion, of a surfactant, a frothing or foaming agent and a coupling agent, together with a liquefied gas propellant which is miscible with the aqueous solution of the named components, and which, upon vaporization during release of the composition from its container, effects the release of said composition as an aerosol.

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**3,585,854**

## METHOD AND APPARATUS FOR INDICATING SURFACE ROUGHNESS

**Neville G. Hanson, Whitley Bay, and Robert P. Hanson, Ryton-on-Tyne,both of, England, assignors to Marine and Industrial Scientific & Technical Services Ltd., Ryton, England**

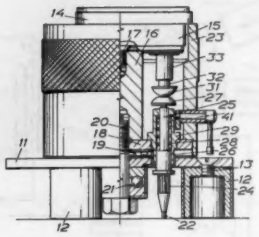
**Filed Apr. 11, 1968, Ser. No. 720,606**

**Claims priority, application Great Britain, Apr. 17, 1967, Mar. 11, 1968, 17,600/67;11,831/68**

**Int. Cl. G01b** *5/28*

**U.S. Cl. 73—105** **8 Claims**

A method and apparatus for indicating the surface roughness of a surface of a material comprising passing an erodable probe along a predetermined path across the surface and transmitting movement corresponding to the amount of probe thereby removed to an indicator. The device for indicating the surface roughness includes a support plate having legs which may be magnetic, contacting the surface, a guide connected to the support plate for guiding an erodable probe along a path across the surface, and a holder




for the erodable probe connected to the guide and loaded under a predetermined pressure by a spring. The indicator is carried by the support plate with appropriate linkage connecting the holder and the indicator. A casing is rotatable above the support plate for transmitting rotational movement to the probe.

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**3,585,855**

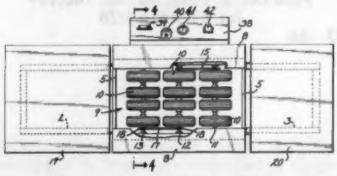
## VEHICLE ENGINE TESTING APPARATUS

**Robert V. Albertson, Wayzata, Minn., assignor to Victor N. Albertson, South Minneapolis, Minn., a part interest**

**Filed Apr. 28, 1969, Ser. No. 819,807**

**Int. Cl. G01l** *5/13*

**U.S. Cl. 73—117** **2 Claims**



A portable power-testing apparatus for small engine-driven vehicles, having treadmill means for supporting engagement with vehicle-driving wheels or drive tracks, and a fluid pump driven by the treadmill means to provide a test load. A tachometer is connected to the treadmill means to register apparent vehicle speeds, and a valve is operative to regulate the flow of fluid delivered by the pump.

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**3,585,856**

## MANUAL TACK MEASUREMENT

**William D. Schaeffer, Coopersburg, Pa., assignor to National Printing Ink Research Institute, New York, N.Y.**

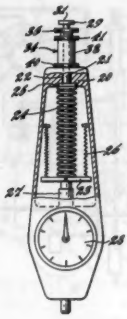
**Continuation-in-part of application Ser. No. 765,818, Oct. 8, 1968, now abandoned. This application Dec. 9, 1969, Ser. No. 883,489**

**Int. Cl. G01n** *19/09*

**U.S. Cl. 73—150** **13 Claims**

To measure tack of a fluid film by the finger, using a push-pull gage, the motion of a probe from the null position under the force of the finger is limited to less than 1 millimeter, and the maximum force recorded during repeated rapid retraction of the finger and splitting of the film. Fifteen to twenty splitting cycles of a single film are required in a single test to obtain the maximum reading. The film thickness after dis-

tribution in the multiple splitting cycles is from 10 to 40 microns. In testing films of the character of printing inks, the maximum spring biasing force opposing the pull is in the range of 1 to 2 kilograms. In the preferred form, the probe is circular or square, and has a surface area between 0.18 and 0.30 square inch.



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**3,585,857**

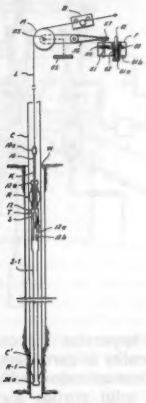
**FREE POINT INDICATOR APPARATUS**

**Lawrence K. Moore, 243 Willow Bend, Huntsville, Tex.**

**Filed Jan. 17, 1969, Ser. No. 791,902**

**Int. Cl. E21b *47/12***

**U.S. Cl. 73—151** **6 Claims**



An improved free point indicator apparatus for indicating whether pipe in a well is free or stuck at particular elevations. A tapered, notched control rod coacts with a pivoted catch finger to indicate relative movement between two pipe sections.

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**3,585,858**

**SIGNAL ERROR COMPENSATED FLUIDIC OSCILLATOR TEMPERATURE SENSORS**

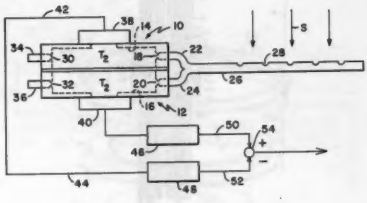
**Jay I. Black, Orange, Conn., assignor to Avco Corporation, Stratford, Conn.**

**Filed Nov. 28, 1969, Ser. No. 880,527**

**Int. Cl. G01k *11/22***

**U.S. Cl. 73—339 A** **4 Claims**

A pair of fluidic oscillators are placed back to back and their resonant cavities, which have different geometry constants, are separated by a relatively thin sheet of high thermal conductivity material. The cavities have a mutual inlet from which a supply of the gas, whose temperature is to be measured, enters the oscillators. The flow of gas through the oscillators causes the pressure in the chambers to oscillate at different resonant frequencies. The frequencies are measured by suitable transducers and the output of the transducers fed to circuitry which produces a signal output representing the difference in frequency between the two cavities. The relatively thin sheet causes the cavity temperatures to be identical. Therefore, the signal error caused by heat loss from the oscillators ambient is substantially compensated for.



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**3,585,859**

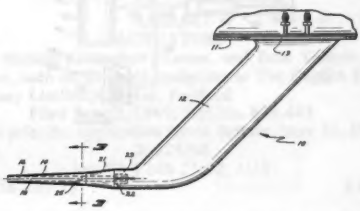
**AERODYNAMICALLY COMPENSATED STATIC PRESSURE TUBE**

**Richard V. De Leo, Hopkins, and Floyd W. Hagen, Minneapolis, both of, Minn., assignors to Rosemount Engineering Company, Minneapolis, Minn.**

**Filed May 26, 1969, Ser. No. 827,504**

**Int. Cl. G01i *7/00***

**U.S. Cl. 73—388** **16 Claims**



A strut-mounted static pressure tube which is aerodynamically compensated to obtain desired static pressure measurements under supersonic flight conditions as well as under subsonic flight conditions. Compensation of the measured static pressure at the probe is achieved for both subsonic and supersonic operation of aircraft with one instrument.

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**3,585,860**

**SAMPLING VALVE FOR HIGH TEMPERATURE CORROSIVE GASES**

**Frank B. Alt, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio**

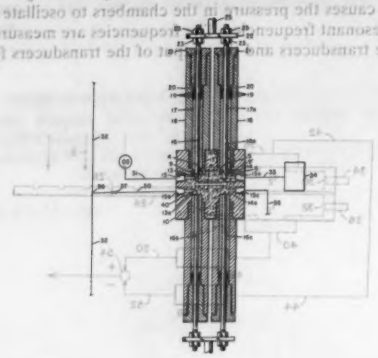
**Filed Feb. 10, 1969, Ser. No. 797,848**

**Int. Cl. G01n *1/26***

**U.S. Cl. 73—421.5** **5 Claims**

A sampling valve receiving a continuous carrier gas and intermittent samples of high temperature, corrosive gases has a valve body of high-temperature material with two passageways through the valve body which are interconnected at two points where two valve chambers extend through the valve body so as to intersect the passageways. A

portion of one passageway between the interconnections serves as a sample reservoir and the two valve chambers each



support two valve stems, one in each end of the chamber. Housing means encloses packing means which in turn encloses each valve stem.

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**3,585,861**

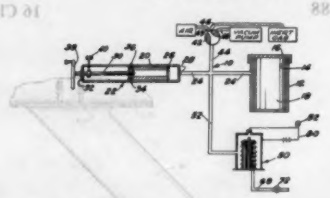
**METHOD FOR VOLUME MEASUREMENT**

**Edward Y. H. Keng, Smyrna, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.**

**Division of Ser. No. 603,034, Dec. 19, 1966, Pat. No. 3,453,881. Filed June 5, 1969, Ser. No. 830,686**

**Int. Cl. G01f *17/00*; G01n *7/04*, *15/08***

**U.S. Cl. 73—432** **6 Claims**



A method for precisely determining the volume of gases, irregular bodies and powdered materials, employing a variable volume hermetically sealed system including a reference compartment within which the material to be measured is placed. A predetermined gas pressure is established within said reference compartment when it is empty and again, the same pressure is established when the compartment contains the said material, a pressure detecting mechanism being employed to register the attainment of the said pressure.

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**3,585,862**

**DEVICE FOR INTRODUCING SAMPLES INTO A CHROMATOGRAPHIC COLUMN**

**Jiri Hrdina, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Prague, Czechoslovakia**

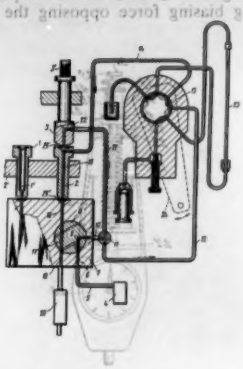
**Filed Apr. 8, 1969, Ser. No. 814,375**

**Claims priority, application Czechoslovakia, Apr. 9, 1968, 2627-68**

**Int. Cl. G01h *1/00***

**U.S. Cl. 73—422** **3 Claims**

A device for introducing liquid samples into a liquid chromatographic column which includes provision for alternatively utilizing a series of cartridges into which samples have been previously deposited or a sample valving arrangement of a conventional type having a capillary loop by which samples may be introduced "on the spot." This is accomplished by providing an alternative passage member or fitting sub-



stituted in place of the cartridge providing connections for the capillary loop samples.

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**3,585,863**

**METHOD AND DEVICE FOR INTRODUCING SAMPLES INTO A CHROMATOGRAPHIC COLUMN**

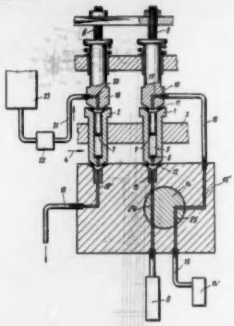
**Jiri Hrdina, Prague, Czechoslovakia, assignor to Ceskoslovenska adademie ved, Prague, Czechoslovakia**

**Filed Apr. 8, 1969, Ser. No. 814,324**

**Claims priority, application Czechoslovakia, Apr. 9, 1968, 2629/68**

**Int. Cl. G01n *1/00***

**U.S. Cl. 73—422GC** **7 Claims**



A method and apparatus for carrying out liquid chromatography. A plurality of cartridges are transported sequentially into fluid communication with the column. Each cartridge contains a solid porous sorption material retained between perforated plates. Immediately before moving into the location where the cartridge is in communication with the column, the cartridge is clamped in a fluid circuit and deaeration of the sorption material is carried out by pumping a liquid through the cartridge. After deaeration of the porous material, eluent liquid is pumped through the cartridge and into the column and the danger of the inclusion of air bubbles in the stream is eliminated.

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**3,585,864**

**CONTINUOUS SAMPLING APPARATUS FOR DIVIDED MATERIALS**

**Roland Dellyes, Paris, France, assignor to Societe Anonyme: Ciments Lafarge, Paris, France**

**Filed Mar. 10, 1969, Ser. No. 805,456**

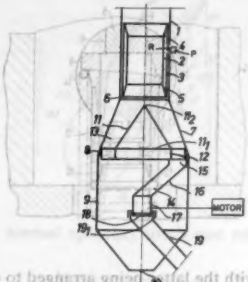
**Claims priority, application France, Mar. 28, 1968, 145,806**

**Int. Cl. G01n *1/20***

**U.S. Cl. 73—424** **27 Claims**

An apparatus for the continuous sampling of divided materials. The material to be sampled is supplied as a vertical

annular stream and is partially sampled by means having a uniform rotational movement around the axis of revolution of the annular stream. The volume rate of flow sampled is a



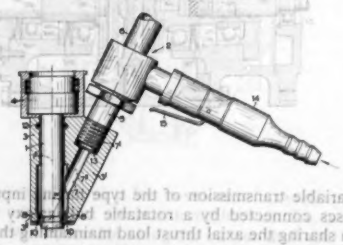

well-defined fraction of the volume rate of flow at the input of the apparatus, and the sampled portion is conveyed to any appropriate measuring, analytical or adjusting instrument.

**3,585,865**

**APPARATUS FOR THE ULTRASONIC TESTING OF METAL WALLS**

**Josef Bungart, Wesseling, and Walter Herzfeld, Knapsack, both of, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, Germany**

**Filed Dec. 18, 1968, Ser. No. 784,566**
**Claims priority, application Germany, Dec. 23, 1967, P 16 48 565.7**
**Int. Cl. G01n** *24/00*
**U.S. Cl. 73—71.5** **6 Claims**



Hot metal walls are subjected to ultrasonic testing by means of a supersonic probe which is arranged so as to be cooled by means of a cold stream coming from a Hilsch tube.

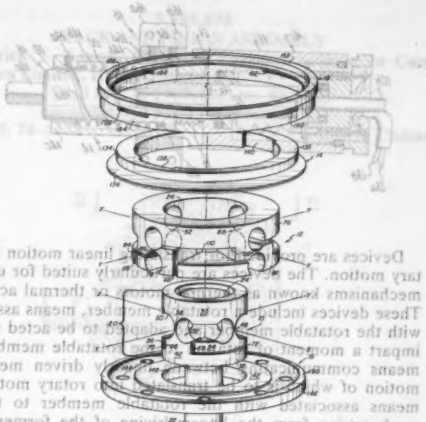
**3,585,866**

**GYROSCOPE FLEXURE HINGE SUSPENSION**

**Willis B. Ensinger, Silver Spring, Md., assignor to Singer-General Precision, Inc., Little Falls, N.J.**

**Filed July 1, 1969, Ser. No. 838,100**
**Int. Cl. G01c** *19/18*
**U.S. Cl. 74—5** **13 Claims**

An improved flexure hinge suspension for use in free-rotor displacement type gyroscopes is provided comprising an inner hinge unit and an outer hinge unit concentrically nested one within the other in a generally parallel manner coaxial with the gyro's spin or reference axis. Each hinge unit, in turn, comprises a frictionless, four-bar, two-axis, universal-joint suspension element for supporting the gyro's inertial flywheel relative to the spin axis in a particular directional mode. That is, in the outer hinge unit, the flexure bars have their respective longitudinal axes arranged perpendicular to the spin axis so as to support the flywheel against torsional and radial displacements relative to the spin axis while in the inner hinge unit the flexure bars have their respective longitudinal axes oriented parallel to the spin axis so as to support the flywheel against axial displacements along the spin axis. In each hinge unit the flexure bars comprise locally thin necked-down sections formed by machining a corresponding pair of closely spaced holes completely through the peripheral wall of each unit as the case may be. Thus, when the two units are positioned relative to each other before being rigidly fastened together, the desired



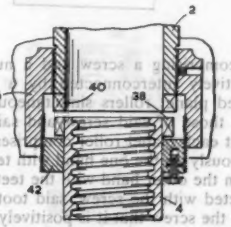
exact orthogonal alignment between the flexure bars in the outer unit and the corresponding flexure bars in the inner unit may be facilitated by a simple visual inspection thereof. The flexure hinge assembly furthermore includes angle stop means for safely limiting the angular displacement of its hinge gimbals thereby preventing the delicate thin flexure bars from being overstressed or ruptured in operation.

**3,585,867**

**ACTUATORS**

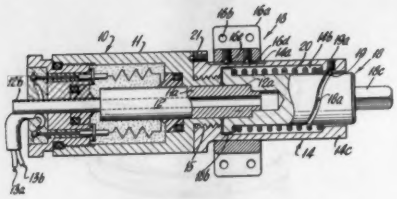
**Edward Michael Grimshaw, Luton, and Ivan Yehudi Hirsh, Harrow, both of, England, assignors to The English Electric Company Limited, London, England**

**Filed June 2, 1969, Ser. No. 829,443**
**Claims priority, application Great Britain, May 31, 1968, 26225/68**
**Int. Cl. F16h** *21/02, 1/18*
**U.S. Cl. 74—89.15** **9 Claims**




This invention relates to an actuator with a reversible output member, such as a nut, which is in driving engagement with an output shaft. The output member has, adjacent one end, driving engagement means, such as dogs, which engage with corresponding parts at the bottom of a recess at the end of the shaft, the main part of the output member either lying within, or projecting from, the shaft. The output member is secured in position by an externally threaded retainer which screws into the recess. The recess is provided by a tubular member which forms a permanent extension of the shaft.

**3,585,868**
**LINEAR MOTION INTO ROTARY MOTION**
**Robert T. Scott, Boonton, N.J., assignor to International Controls Corporation, Fairfield, N.J.**
**Filed May 8, 1969, Ser. No. 823,126**
**Int. Cl. F16h** *27/02, 55/04*
**U.S. Cl. 74—89.15** **8 Claims**



Devices are provided for translating linear motion into rotary motion. The devices are particularly suited for use with mechanisms known as thermal motors or thermal actuators. These devices include a rotatable member, means associated with the rotatable member and adapted to be acted upon to impart a moment of rotation to the rotatable member, and means communicating between linearly driven means the motion of which is to be translated into rotary motion and means associated with the rotatable member to transmit work arising from the linear driving of the former to the latter to rotate the rotatable member. When one of these devices is utilized in combination with a thermal motor, the linearly driven member is part of the thermal motor.

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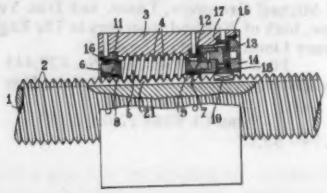
**3,585,869**
**SCREW AND SOCKET MECHANISM**
**Pierre Lemor, Ville D'Avray, France, assignor to Aktiebolaget Svenska Kullagerfabriken, Goteborg, Sweden**
**Filed June 27, 1969, Ser. No. 837,078**
**Claims priority, application France, June 27, 1967, 156,851**
**Int. Cl. F16h** *27/02, 1/18, 55/04*
**U.S. Cl. 74—89.15** **3 Claims**



A device comprising a screw and a nut-forming tapped socket operatively interconnected by a set of externally screw-threaded planet rollers simultaneously engaging with their threads those of said screw and said socket, characterized in that each planet roller comprises gear teeth meshing simultaneously on the one hand with teeth carried by the socket and on the other hand with the teeth of a ring operatively connected with the screw, said toothed ring being so connected to the screw that it is positively held against rotation with respect to said screw but allow to move axially in relation thereto.

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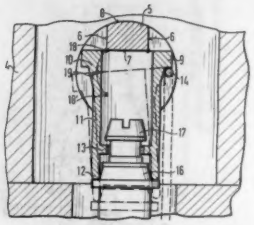
**3,585,870**
**SWITCH PLUNGER ACTUATING DEVICE**
**August Reinke, Wiedenhofkamp 1, Radevormald, Germany**
**Filed June 6, 1969, Ser. No. 831,053**
**Claims priority, application Germany, July 9, 1968, P 17 63 646.3**
**Int. Cl. F16h** *21/44*
**U.S. Cl. 74—107** **5 Claims**

A switch plunger actuating device having a manually turnable shaft with an eccentric portion, and a plunger-actuating part with an axis and opposite ends, of which one end is adapted for pivotal connection with the plunger, and the other end is in spring-urged engagement with the eccentric shaft portion, with the latter being arranged to engage the adjacent part end at a distance from the axis which remains constant as the shaft is turned.



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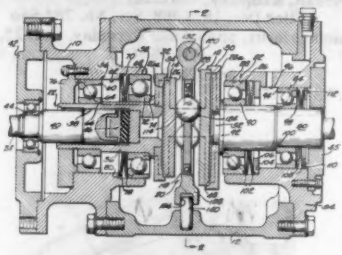
**3,585,871**
**VARIABLE TRANSMISSION**
**Richard E. Alsch, Lannon, Wis., assignor to Graham Transmissions, Inc., Menomonee Falls, Wis.**
**Filed Oct. 28, 1969, Ser. No. 871,836**
**Int. Cl. F16h** *15/26, 15/08*
**U.S. Cl. 74—198** **8 Claims**



A variable transmission of the type having input and output discs connected by a rotatable ball galaxy has a dual system sharing the axial thrust load maintaining the input and output discs in motion transmitting engagement with the balls. A first pair of ball bearings are disposed one on each of the shafts connected to the discs and abut shoulders on the shafts to thereby limit bearing movement toward the discs and ball galaxy. Springs urge each of these first pair of ball bearings toward the discs and ball galaxy thereby providing an axial force maintaining motion transmitting engagement. A second pair of ball bearings are disposed axially outboard, relative to the discs and ball galaxy, of the first pair of bearings. The second bearings are also disposed one on each of the shafts and abut shaft shoulders limiting bearing movement toward the discs and balls. A spring engages one of the bearings of this second set and reacts through the other bearing to provide an additional axial force maintaining motion transmitting engagement. The bearings of the first pair have a slip fit on their respective shafts and the axial force transmitted through said second bearings bypasses the first bearings.

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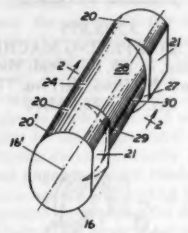
**3,585,872**
**CUTTER CHAIN**
**Glenn S. McDowell, 601 Wiley Ave., Franklin, Pa.**
**Filed Apr. 2, 1969, Ser. No. 812,758**
**Int. Cl. F16g** *13/04*
**U.S. Cl. 74—254** **9 Claims**

A cutter chain employing pintles having end portions non-

rotatively retained within cutter carrying links and having a recessed central portion along one side to allow space for



greater than normal sprocket tooth size relative to a given pitch length.

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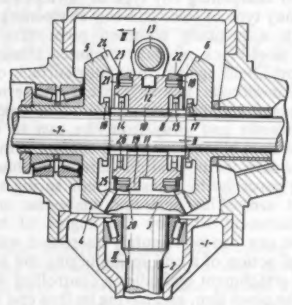
**3,585,873**

**SYNCHRONIZING DEVICE FOR BEVEL-WHEEL REVERSING GEAR SYSTEMS**

**Jorg Austen, Weinsberg, Germany, assignor to Firma Dr.-Ing.H. C. F. Porsche KG, Stuttgart, Germany**

**Filed July 9, 1969, Ser. No. 840,222**
**Claims priority, application Germany, July 10, 1968, P 17 75 155.2**
**Int. Cl. F16h** *3/38, 3/14;* **F16d** *11/06*
**U.S. Cl. 74—339** **10 Claims**



A synchronizing device for bevel-wheel reversing gears, particularly adapted for use in automotive vehicles, including a clutch sleeve displacable along the output shaft and having teeth thereon adapted to engage with coupling teeth provided at the output bevel gears.

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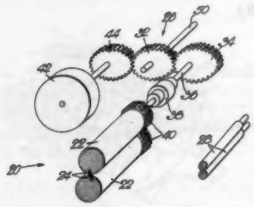
**3,585,874**

**ENERGY-BALANCED DRIVE OF A CYCLICALLY SURGING ROTARY SYSTEM**

**James D. Ingham, Thomaston, Conn., assignor to The Hallden Machine Company, Thomaston, Conn.**

**Filed Aug. 22, 1969, Ser. No. 852,363**
**Int. Cl. F16h** *35/02*
**U.S. Cl. 74—393** **20 Claims**



Two rotary systems, each including a driven gear, and a drive for the systems, including a common drive shaft and two driving gears carried thereby, of which each driving gear is paired and meshes with a driven gear, and the gears of each pair are surge gears, with the pitchline profiles of the driven gears and the mass polar moments of inertia of the systems being different so that the systems are dynamically balanced at any instant at constant angular velocity of the drive shaft.

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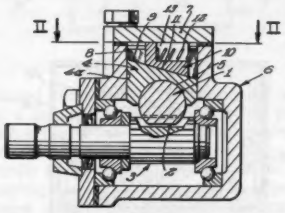
**3,585,875**

**RACK AND PINION ASSEMBLY**

**Frederick J. Adams, Campton, England, assignor to Cam Gears Limited, Hitchin, England**

**Filed Dec. 4, 1969, Ser. No. 882,065**
**Int. Cl. F16h** *1/04, 19/04*
**U.S. Cl. 74—422** **11 Claims**



A rack and pinion assembly, especially suited for automotive steering linkages, having at least one yoke member slidably supporting the rack bar on the side remote from the rack, and preferably directly opposite that portion of the rack engaging the pinion, wherein the yoke is urged against the rack bar by a spring biased slipper in wedge-fitting, sliding relationship with the yoke. The slipper and yoke have inclined mating surfaces which establish a nonreversing wedge angle relationship so that the spring bias need only be sufficient to take up looseness and wear without supporting the load on the yoke.

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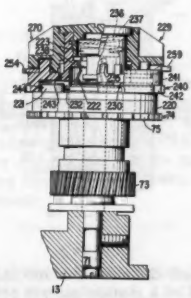
**3,585,876**

**FANCY STITCH ZIGZAG SEWING MACHINES**

**Walter H. W. Marsh, Fanwood; Lionel J. Coulombe, Matawan, N.J., and Norbert Thuring, Karlsruhe (Baden), Germany, assignors to The Singer Company, New York, N.Y., by said Marsh and Coulombe and Singer-Werke G.m.b.H., Karlsruhe (Baden), Germany, by said Thuring**

**Filed May 26, 1969, Ser. No. 827,867**
**Int. Cl. F16h** *53/00*
**U.S. Cl. 74—567** **4 Claims**



A zigzag sewing machine is disclosed which can exchangeably accommodate any one of a variety of differently organized special cam units for producing special patterns of zigzag stitches, zigzag stitch patterns combined with patterned work feed control, or closed stitch groups such as buttonholes. A novel cam unit for buttonholing is disclosed which may be selectively clutched to the cam shaft

while maintaining a constant position lengthwise on the cam shaft. The cam unit for buttonholing is additionally novel in the provision of a clutch mechanism which can be overrun manually at will as for positioning the unit to start but which cannot be overrun by the back pressure of the follower which tracks the cam unit.

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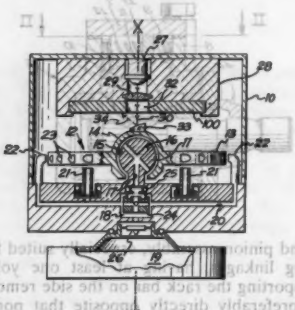
**3,585,877**

**PHOTODYNAMIC PICKOFF SYSTEM FOR A FREE-ROTOR GYROSCOPE**

**Jordon Kass, Wayne, and John L. Evans, Oakland, both of, N.J., assignors to Singer-General Precision, Inc., Little Falls, N.Y.**

**Filed Dec. 4, 1968, Ser. No. 781,213**
**Int. Cl. G01c** *19/28*
**U.S. Cl. 74—5.6** **5 Claims**



A photodynamic pickoff system for a two-axis, free-rotor gyroscope of the gas bearing type, and including a light reflecting means for reflecting an incident light beam to a photoelectric transducer means which provides two-axis positional information in the form of a pulse duration modulated output signals.

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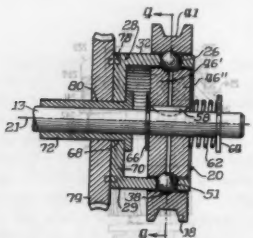
**3,585,878**

**VARIABLE SPEED DRIVE MECHANISM FOR MOTION PICTURE PROJECTORS**

**Ernest W. Heckenbach, Jr., Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.**

**Filed Dec. 31, 1969, Ser. No. 889,488**
**Int. Cl. F16h** *37/06, 15/26, 15/50*
**U.S. Cl. 74—675** **11 Claims**



A variable speed drive mechanism is provided for controlling the speed of a motion picture projector powered by an electric motor operating at a constant speed. The mechanism includes a drive wheel rotatable driven by the electric motor about an axis of rotation, a power takeoff wheel rotatably mounted for independent rotation about the same axis, a plurality of balls rotatably captured between the drive wheel and the power takeoff wheel to cause rotation of the power takeoff wheel in response to rotation of the drive wheel, and means for translating the balls without disengagement from the drive and power takeoff wheels along a path concentric with the axis of rotation of the drive and power takeoff wheels to vary the speed of rotation of the power takeoff wheel.

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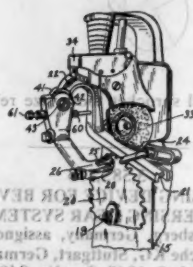
**3,585,879**

**SAW SHARPENING MACHINE**

**George E. Gunderman, R. #3, Blissfield, Mich.**

**Filed Nov. 29, 1968, Ser. No. 779,959**
**Int. Cl. B23d** *63/12*
**U.S. Cl. 76—41** **7 Claims**



This invention relates to improvements in apparatus adapted to effectively mount various types of circular and/or longitudinal saws for optimum sharpening of each saw along the sawtooth edge of any of said saws. It is universally adapted for sharpening any type of sawtooth carried by substantially any type of saw. This saw sharpening device is provided with a pivotally mounted pivot arm supporting a hardened steel block pivotally mounted thereon adapted to be resiliently held against the outer surface of the longitudinal and/or circular saw to prevent chattering of the saw when engaged by the disc grinder. The said arm can be swung upwardly and away from the saw to disengage and release the steel block from direct contact with the outer surface of the saw; the normal pressure of the block against the saw being governed by a resilient coil spring associated with said pivot arm. This invention embodies an antipressure screw attachment whereby the degree of block pressure against the saw can be minutely decreased without effecting the normal action of a coil spring urging the arm toward the saw. This attachment embodies a controlling screw threaded through the pivot arm, and having its free end to bear against a stationary part of the machine. When the screw is turned in a counterclockwise direction, the pivot arm moves downwardly due to the action of the coil spring. When the screw is turned in a clockwise direction, the pivot arm moves outwardly and upwardly, moving the block minutely away from the outer surface of the saw. It is obvious that this novel construction of the pressure controlling screw mounted with the pivot arm provides a novel means to minutely decrease the pressure between the block and the outer surface of said saw as desired.

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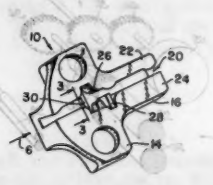
**3,585,880**

**ICE SKATE SHARPENING TOOL**

**Bohuslav Kabriel, 324 Buckingham Drive, Riverside, Ontario, Canada**

**Filed Oct. 7, 1969, Ser. No. 864,344**
**Int. Cl. B21k** *17/00*
**U.S. Cl. 76—83** **10 Claims**



An ice skate sharpening device comprising a generally T-shaped body member including crossarms and a stem having

a U-shaped cross section providing a longitudinal slot extending the length of the stem is disclosed. The slot is closer to one side of the stem than the other and is undercut at the side adjacent the one side to provide a resilient, hingelike connection between the sides of the stem of the body member such that the slot may be opened to accommodate both hockey and figure skate blades. The slot is intersected by a recess centrally located between the crossarms for receiving two carbide cutting inserts which are secured therein at right angles to each other and which are transverse of and perpendicular to the longitudinal axis of the slot. A plurality of projections extend inwardly from the undercut side of the slot and engage a skate blade positioned in the slot to urge the blade against the cutting inserts whereby the skate blade is sharpened on drawing the device over the bottom of the skate blade. The skate is turned to sharpen both sides of the blade.

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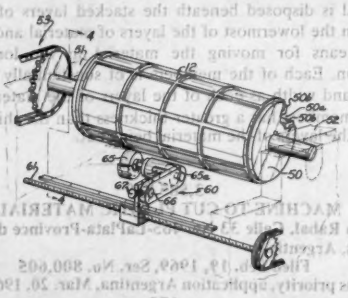
**3,585,881**

**METHOD OF MAKING CUTTING AND CREASING DIES**

**Albert J. Sarka, Fairview Park, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio**

**Filed Dec. 20, 1968, Ser. No. 785,591**
**Int. Cl. B21k** *5/20*
**U.S. Cl. 76—107** **8 Claims**



Platelike sheet material cutting and creasing dies have lands projecting from one surface of a base portion of the die. The lands have a working surface portion at the outer ends thereof. Such material cutting and creasing dies are made by forming lands in sheet metal stock with the lands projecting from one side of the sheet metal stock and located to perform work at selected locations on sheet material. The sheet metal stock with lands formed thereon is then mounted on a cylinder with the other side thereof in substantially intimate contact with the cylinder surface. The outer ends of the lands are then ground while the cylinder is rotated so that the working surfaces of all of the lands are located an accurate uniform dimension relative to the axis of the cylinder.

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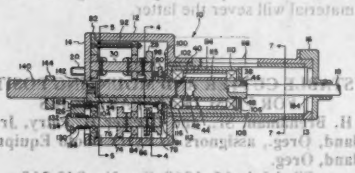
**3,585,882**

**BORING BAR DRIVE MECHANISM**

**James L. Miller, Hampton, Va.**

**Filed Aug. 8, 1968, Ser. No. 751,266**
**Int. Cl. B23b** *39/14*
**U.S. Cl. 408—137** **4 Claims**



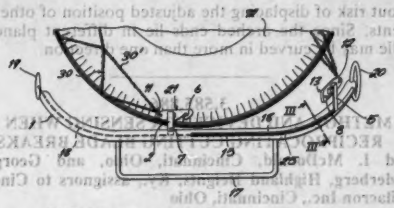
A portable boring bar drive mechanism featuring a compacted gear train, a common feed and boring bar drive, and an automatic feed stop mechanism.

**3,585,883**

**DEVICE FOR MOUNTING TIRE CHAINS**

**Theodor Insam, Jochbergstrasse 20, Kitzbuhel, Tirol, Austria**

**Filed Jan. 8, 1968, Ser. No. 696,207**
**Claims priority, application Austria, Jan. 9, 1967, Jan. 16, 1967, A208/67;A394/67**
**Int. Cl. B60c** *27/06*
**U.S. Cl. 81—15.8** **16 Claims**



A yoke-shaped chain tightener, comprising a rigid guide member and a cooperating member slidable therealong, is placed behind a raised automobile wheel having a traction chain draped over its tire, with the extremities of the yoke curved forwardly at opposite sides of the wheel. A male and a female coupling element are fastened to opposite ends of the rear stringer of the chain, of which the female element may constitute a terminal link, and are loosely fitted into respective seats on the two members which are initially spaced apart and can be moved toward each other by manipulation of a handgrip at one yoke extremity. One coupling element, preferably the male one, is pivotable against a restoring spring force for snap-action engagement with the other element whereupon the two seats can be again separated and the yoke withdrawn.

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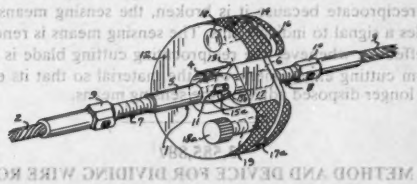
**3,585,884**

**CABLE TURNBUCKLE SPEED WRENCH**

**Lewis L. Leckie, Rte. 2, Box 378, Piedmont, S.C., and Robert L. McFarland, Rte 1, Bennington, Ind.**

**Filed Feb. 19, 1969, Ser. No. 800,647**
**Int. Cl. B25b** *13/00, 21/02, 13/02*
**U.S. Cl. 81—53** **3 Claims**



An aircraft turnbuckle cable adjustment device or speed wrench which is removably interlocked on a turnbuckle intermediate the ends thereof and surrounds the central portion thereof, and is easily manipulatable manually to control and adjust the tension of the cables which are connected, or secured to or in the opposite ends of the turnbuckle and constitute the operating connections between an actuator means and an actuated means.

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**3,585,885**

**ADJUSTABLE TOOL HANDLE**

**Harry A. Carr, 2934 El Caminito St., La Crescenta, Calif.**

**Filed Nov. 21, 1969, Ser. No. 878,760**
**Int. Cl. B25b** *13/00, 1/00*
**U.S. Cl. 81—177F** **14 Claims**

A tool handle readily adjustable in many different configurations utilizing a multiplicity of similar components assembled along a cable and each having oppositely arched ends rigidly clampable in different positions by tensioning the cable. The arched ends have internesting protruberances and depressions held resiliently nested by spring means while the

cable is relaxed and permitting individual pairs of components to be forcibly shifted to a different adjusted position

without risk of displacing the adjusted position of other components. Since the arched ends lie in different planes, the handle may be curved in more than one direction.

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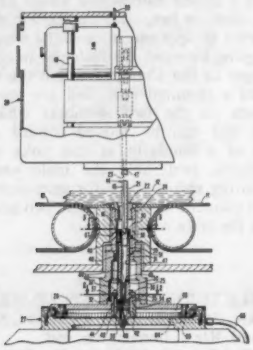
**3,585,886**

**METHOD AND DEVICE FOR SENSING WHEN A RECIPROCATING CUTTING BLADE BREAKS**

**David I. McDonald, Cincinnati, Ohio, and George W. Sederberg, Highland Heights, Ky., assignors to Cincinnati Milacron Inc., Cincinnati, Ohio**

**Filed Oct. 16, 1968, Ser. No. 768,063**
**Int. Cl. B26d 1/10**
**U.S. Cl. 83—13** **18 Claims**



Sensing means is disposed adjacent to the end of a reciprocating cutting blade remote from its reciprocating means. Whenever the end of the reciprocating blade ceases to reciprocate because it is broken, the sensing means provides a signal to indicate this. The sensing means is rendered ineffective whenever the reciprocating cutting blade is lifted from cutting engagement with the material so that its end is no longer disposed adjacent the sensing means.

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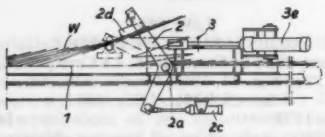
**3,585,887**

**METHOD AND DEVICE FOR DIVIDING WIRE ROD**

**Berz Gerhard, and Klaus Kuppers, both of Dusseldorf, Germany, assignors to Schloemann Aktiengesellschaft, Dusseldorf, Germany**

**Filed Apr. 15, 1969, Ser. No. 816,284**
**Claims priority, application Germany, Apr. 18, 1968, P 17 52 196.9**
**Int. Cl. B26d 7/00**
**U.S. Cl. 83—18** **8 Claims**



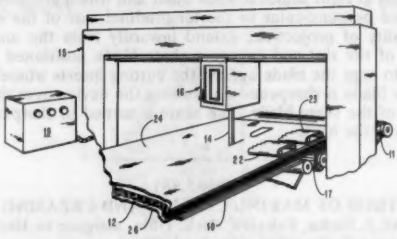
A method and apparatus for cutting wire rod which has been laid in loops on a moving conveyor wherein a portion of wire rod between two loops is made accessible for cutting by moving some of the loops out of the plane of the conveyor.

**3,585,888**

**MATERIAL RETAINING MEANS FOR MATERIAL CUTTING MACHINE**

**James G. Wiatt, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio**

**Filed June 23, 1969, Ser. No. 835,385**
**Int. Cl. B26d 1/28**
**U.S. Cl. 83—14** **15 Claims**



A first member of a nonwoven material is disposed above a plurality of stacked layers of material that are to be cut by longitudinal movement of the material relative to a transversely movable cutting blade. A second member of nonwoven material is disposed beneath the stacked layers of material between the lowermost of the layers of material and the support means for moving the material in the longitudinal direction. Each of the members is of substantially the same length and width as each of the layers of the material. Each of the members has a greater thickness than the thickness of any of the layers of the material being cut.

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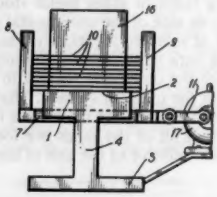
**3,585,889**

**MACHINE TO CUT PLASTIC MATERIALS**

**Alfredo Rabal, Calle 33 No. 465-LaPlata-Province de, Buenos Aires, Argentina**

**Filed Feb. 19, 1969, Ser. No. 800,605**
**Claims priority, application Argentina, Mar. 20, 1968, 213 175**
**Int. Cl. B26d 7/10**
**U.S. Cl. 83—171** **3 Claims**



A machine for severing plastic material in which an elongated severing element in form of a metal band or wire is reciprocated at high speed while the plastic material is pushed thereagainst so that the heat resulting from the friction between the reciprocating severing element and the plastic material will sever the latter.

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**3,585,890**

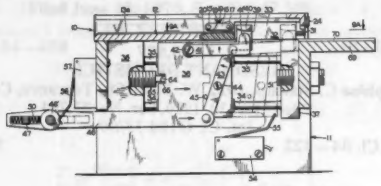
**ADJUSTABLE CUTTER AND MOUNTING POSITIONER FOR FILM TRANSPARENCIES**

**Albert H. Brenaman, Sr., and Chester H. Petry, Jr., both of Portland, Oreg., assignors to Byers Photo Equipment Co., Portland, Oreg.**

**Filed July 16, 1969, Ser. No. 842,215**
**Int. Cl. B26d 5/20**
**U.S. Cl. 83—247** **5 Claims**

A device for cutting transparencies from strips of film of standard width but with picture areas of different size, the

device having means for adjusting the length of the sections cut off from the filmstrip to correspond to the length of the



individual transparencies, and having adjustable means controlling the positioning of the cutoff sections on the corresponding transparency mounts.

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**3,585,891**

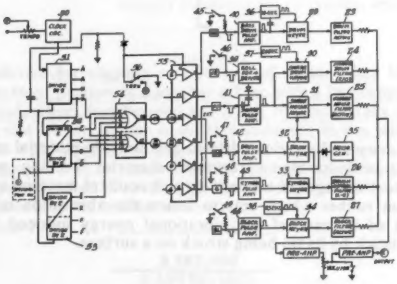
**ELECTRONIC RHYTHM GENERATOR PARTICULARLY SUITABLE FOR INTEGRATED CIRCUITRY**

**Harold O. Schwartz, Tonawanda; Peter E. Maher, and John E. Holt, both of North Tonawanda, all of, N.Y., assignors to The Wurlitzer Company, Chicago, Ill.**

**Filed May 23, 1969, Ser. No. 827,234**

**Int. Cl. G10h** *5/00, 1/02;* **G10f** *1/00*

**U.S. Cl. 84—1.03** **12 Claims**



An electronic circuit for electrically simulating the sound of a plurality of rhythm instruments being played in any one of a plurality of different rhythmic patterns. The rhythmic patterns are generated by a clock pulse generator, a frequency divider, and a logic circuit which cooperate to produce pulses in rhythmic patterns which are characteristic of several different types of music. These pulses are applied to the plurality of keyed audio circuits which each produce a characteristic burst of output signals that simulate the audible output of a corresponding rhythm instrument. The keyed audio circuits include an audio oscillator, and means for repetitively coupling audio signals to the filter circuits in short bursts in synchronism with the rhythmic pulse patterns. The logic circuits, audio circuits, pulse switching circuits, and overall circuit configuration are arranged for maximum utilization of integrated circuits, interchangeable subcircuits, and printed circuits.

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**3,585,892**

**SIGNAL SELECTING SYSTEM FOR KEYBOARD TYPE ELECTRONIC MUSICAL INSTRUMENT WITH CONDUCTIVE AND NONCONDUCTIVE SWITCHES TO ACTUATE KEY-GATES**

**Takatsugu Nakajima, and Takao Sato, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

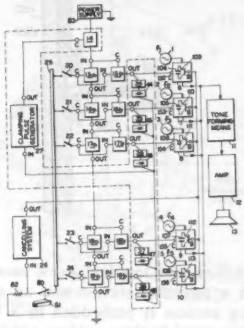
**Filed Jan. 19, 1970, Ser. No. 3,921**

**Claims priority, application Japan, Jan. 18, 1969, Jan. 18, 1969, 44/4299;44/4301**

**Int. Cl. G10h** *3/00*

**U.S. Cl. 84—1.13** **16 Claims**

In a signal selecting system for a keyboard type electronic musical instrument comprising: (1) a plurality of tone generators, (2) a plurality of key-gates, (3) a plurality of normally conductive switching devices, (4) a plurality of normally nonconductive switching devices, and (5) a plurality of keyswitches. The plurality of tone generators generate tone signals having frequencies corresponding to the notes of a musical scale, and the plurality of key-gates are coupled to said tone generators, respectively. The normally conductive switching devices are connected in series to each other and, at one end, to a power supply and, at another end, to the



ground. Each of said plurality of normally nonconductive switching devices has a control terminal, an input terminal and an output terminal connected respectively to an input terminal of a normally conductive switching device and a control terminal of a key-gate. The plurality of keyswitches are operated by the corresponding keys of the keyboard, and each of said keyswitches is connected, at one end, to a control terminal of a normally conductive switching device, and, at another end, to ground.

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**3,585,893**

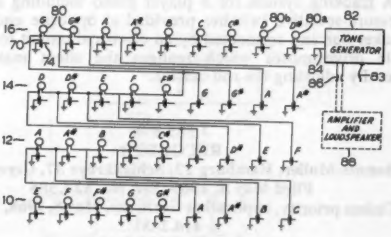
**FOOT OPERATED ELECTRONIC MUSICAL INSTRUMENT**

**John Paul Arseneault, 25 Seely Drive, Apt. 110, Downsview, Ontario, Canada**

**Filed Nov. 15, 1968, Ser. No. 776,021**

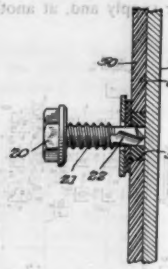
**Int. Cl. G10h** *1/00, 5/00*

**U.S. Cl. 84—1.17** **7 Claims**



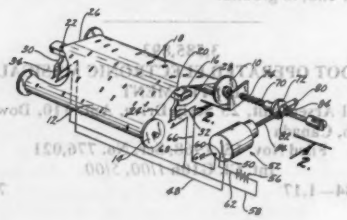

An electronic foot operated base guitar having a thin transportable housing. Four rows of foot pedals project from the housing top and define nine evenly spaced columns. Each row corresponds to a string of a base guitar and each column corresponds to a fret. A single tone generator in the housing is activated by the highest note played. Rounded, well spaced foot pedals on spring steel mounts permit rapid, discrete foot movements.

3,585,894
**SELF-DRILLING AND TAPPING SCREW WITH LEAD UNIT**
Fred Brown, Chicago, Ill., assignor to Union Tank Car Company, Chicago, Ill.
Filed June 2, 1969, Ser. No. 829,528
Int. Cl. F16b *23/00*
U.S. Cl. 85—41 5 Claims



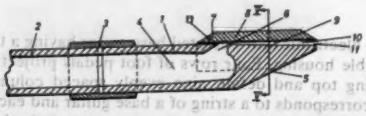

A self-drilling and tapping screw assembly comprising a screw with a threaded section and an end drilling section. The drilling section is embedded in a lead unit which includes a thin metal backup washer, a thin rubberlike surface sealing washer and a relatively thicker, smaller diameter, thread sealing washer. The drilling point of the drilling section extends to adjacent a contact surface of the thicker washer.

3,585,895
**PLAYER PIANO TRACKING SYSTEM**
Richard L. Cannon, and Leonard R. D. Smith, both of Yankton, S. Dak., assignors to Dale Electronics, Inc., Columbus, Nebr.
Filed June 13, 1969, Ser. No. 833,133
Int. Cl. G10f *5/06*
U.S. Cl. 84—137 5 Claims



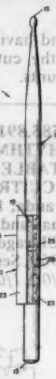
A tracking system for a player piano including a pair of pressure-sensitive switches provided at opposite ends of the tracker bar and connected by an electrical circuit to a reversible drive motor which realigns the sheet material by laterally adjusting the roll carrier.

3,585,896
**RECORDER**
Johannes Muller, Hamburg 13, Schlankreye 37, Germany
Filed May 8, 1969, Ser. No. 824,385
Claims priority, application Germany, May 8, 1968, R12 90 414.2–51
Int. Cl. G01d *7/02*
U.S. Cl. 84—384R 8 Claims



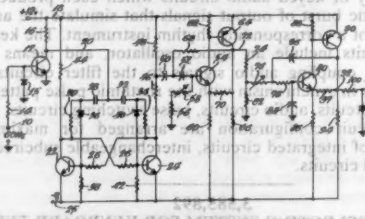
A recorder comprising a pipe-tube with a blowhole having a lip edge being concavely curved in a direction normal to the longitudinal axis of the pipe-tube, and a mouthpiece with a windway narrowing towards said blowhole and preferably having a plane bottom wall and a cylindrically shaped top wall.

3,585,897
**RESONANT DRUMSTICK**
Josephine C. Stalcup, 1022 W. 210th St., Torrance, Calif.
Filed Mar. 30, 1970, Ser. No. 23,704
Int. Cl. G10d *13/00*
U.S. Cl. 84—422 5 Claims



A drumstick fabricated from any suitable material such as wood and having a recessed diameter holding portion whereat is disposed a relatively soft resilient material such as a gum rubber which acts to lessen the absorption into the hand of its user of the vibrational energy induced in the drumstick by its tip being struck on a surface.

3,585,898
**MUSICAL INSTRUMENT TUNING REFERENCE STANDARD**
Peter Davidson, Chicago, Ill., assignor to Hammond Corporation, Deerfield, Ill.
Filed Mar. 12, 1970, Ser. No. 18,909
Int. Cl. G10g *7/02*
U.S. Cl. 84—454 20 Claims



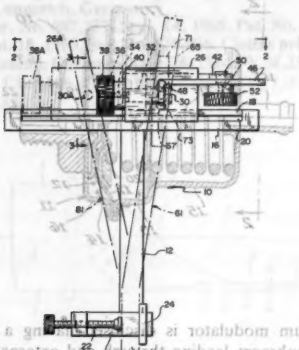
A reference standard for supplying E at 330 Hz. for tuning a guitar or similar instrument. This is accomplished by taking the standard 60 Hz. powerline frequency, dividing it by two to get a 30 Hz. fundamental with odd harmonics and isolating the 11the harmonic by dynamic filtration. The final signal has the desirable range of harmonics accompanying the 330 Hz. fundamental. Variations are shown, including adapting the system for operation on 50 Hz. powerline frequency.

3,585,899

## ALIGNMENT DEVICE

Anthony Jaras, 3800 18th Ave., Kenosha, Wis.

Filed June 18, 1970, Ser. No. 47,540
Int. Cl. G10g 7/00
U.S. Cl. 84—458 10 Claims



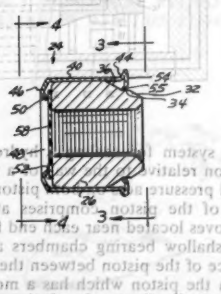
A device for aligning an aperture of a piano key button with a front portion of a key has a base with a key support at one end, while its other end has a pair of spaced rails defining a slot. A pin holder is slidably mounted in the slot and carries a pin adapted to extend into a balance pin aperture of the key. An arm is secured to the pin holder and has a pin engaging member mounted thereon for engaging a tip of the pin carried by the holder.

3,585,900

## CAPPED NUT

Joseph W. Chaivre, Royal Oak, Mich., assignor to Towne Robinson Fastener Company, Dearborn, Mich.

Filed May 16, 1969, Ser. No. 825,331
Int. Cl. F16b 37/14
U.S. Cl. 85—35 4 Claims



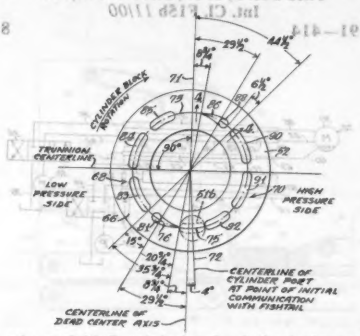
A nut which has a conical end extending into a cylindrical land portion. The land portion connects the conical end with a chamfered portion of the nut head which is covered with a hard corrosion resistant cap extending all around the sides of the nut head. The cap is crimped around the upper end of the nut head to retain a disc or button to close the cap of the nut. The portion of the cap adjacent the chamfered portion of the nut head is formed into a radial flange, which in assembly is crimped against the chamfered portion of the nut head to provide a secure sealing engagement of the button on the nut.

3,585,901

## HYDRAULIC PUMP

Harry C. Moon, Jr., Oglesby; Stephen R. Schoening, Urbana, and John C. Knobloch, Peru, all of, Ill., assignors to Sundstrand Corporation

Filed Feb. 19, 1969, Ser. No. 800,527
Int. Cl. F04b 9/02; F01b 13/04
U.S. Cl. 91—6.5 11 Claims


CYLINDER BLOCK ROTATION
TRUNNION CENTERLINE
LOW PRESSURE SIDE
HIGH PRESSURE SIDE
CENTERLINE OF CYLINDER PORT AT POINT OF INITIAL COMMUNICATION WITH FISHTAIL
CENTERLINE OF DEAD CENTER AXIS

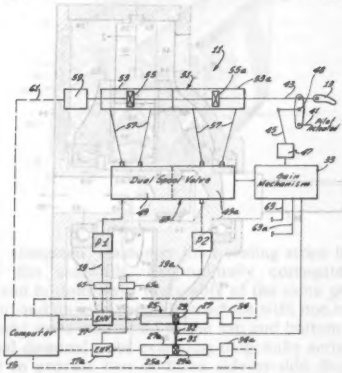
A hydraulic pump of the multiple piston and cylinder type having inlet and outlet ports in a valve plate which serially communicate with the cylinders, with each of the ports being defined by the following, (1) a tapered fishtail groove which communicates with each cylinder prior to the time the piston in the cylinder reaches one of its dead center positions (2) a circular port extending through the valve plate and communicating with the trailing end of the fishtail groove, and (3) an elongated arcuate port separate from and trailing the circular port.

3,585,902

## GAIN MECHANISM AND SYSTEM THEREFOR

Robert L. Anderson, Tustin, Calif., assignor to Bertea Corporation, Irvine, Calif.

Filed Apr. 21, 1969, Ser. No. 817,977
Int. Cl. F15b 13/16, 13/06
U.S. Cl. 91—363 29 Claims




This disclosure describes a gain mechanism which may include a first member, shiftable means for selectively pivotally mounting the first member on a supporting structure for pivotal movement about any one of a plurality of pivotal axes, an input member drivingly connectable to the first member for driving the first member about any of the pivotal axes, and an output member drivingly connected to the first member and driven thereby when the first member is pivoted about any of the pivotal axes. A characteristic of the motion

of the output member is changed in relation to the motion of the input member as a result of the shiftable means changing the pivotal axis about which the first member pivots.

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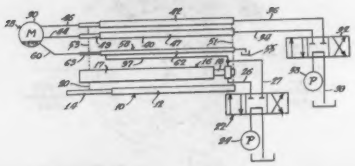
**3,585,903**
**DRAIN FEEDTUBE FOR HYDRAULIC MOTOR**
**John T. Parrett, Benton Harbor, Mich., assignor to Koehring Company**
**Filed Dec. 5, 1969, Ser. No. 882,630**
**Int. Cl. F15b** *11/00*
**U.S. Cl. 91—414** **8 Claims**



A telescopic feedtube for draining fluid from the housing of a motor carried on the end of an extensible boom or the like, separate from feedtubes which convey motive fluid to and from the motor, there being provided a reciprocating hydraulic motor for the boom controlled by a valve which is also connected to selectively supply fluid to the drain tube during retracting of the actuator for the purpose of providing a retracting force on the feedtube when the actuator is retracted minimizing the tendency of the drain feedtube to collapse.

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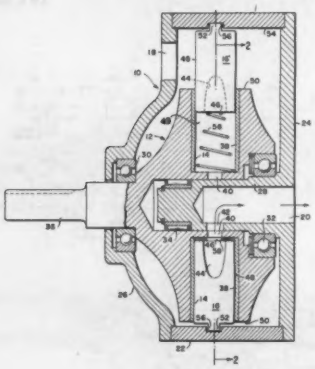
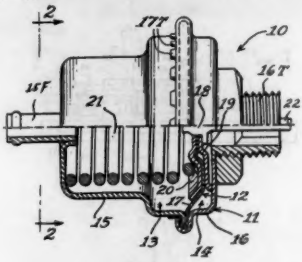
**3,585,904**
**COMPRESSOR**
**Meyer P. White, 157 Clark Road, Brookline, Mass.**
**Filed Nov. 26, 1968, Ser. No. 778,989**
**Int. Cl. F04b** *1/10*
**U.S. Cl. 91—498** **12 Claims**



A compressor having a housing and an eccentrically mounted rotor in the housing. A plurality of pistons reciprocate in the rotor and bear against the housing. Passages in the pistons allow gas to flow underneath the pistons when the pistons are in the extended position, and the gas is compressed in the cylinders as the pistons move inwardly and expelled through a port at the inner end of each cylinder.

**3,585,905**
**MODULATOR DIAPHRAGM AND METHOD OF ASSEMBLY**
**Stuart A. Mason, Bridgeport, Conn., and Ben L. Ehlin, Brooklyn, N.Y., assignors to Casco Products Corporation, Bridgeport, Conn.**
**Filed June 16, 1969, Ser. No. 833,567**
**Int. Cl. F16j** *3/00*
**U.S. Cl. 92—100** **3 Claims**



A vacuum modulator is disclosed having a peripherally tabbed diaphragm leading through and externally of folded clamping flanges to provide a visible cue of the registry of the diaphragm relative to the clamping flanges.

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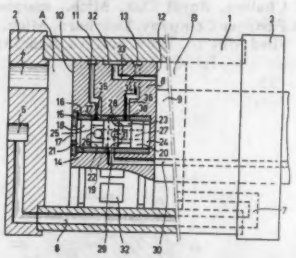
**3,585,906**
**PISTON SEALING CONTROL SYSTEM**
**Hillebrand Johannes Josephus Kraakman, Emmasingel, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.**
**Filed Sept. 16, 1969, Ser. No. 858,419**
**Claims priority, application Netherlands, Sept. 18, 1968, 6813305**
**Int. Cl. F01b** *31/00*
**U.S. Cl. 92—111** **2 Claims**



A control system for sealing a hydrostatically journaled working piston relative to the wall of a working cylinder, in which a fluid pressure acts on both piston end faces. The circumference of the piston comprises at least two circumferential grooves located near each end face of the piston. A plurality of shallow bearing chambers are arranged on the circumference of the piston between the grooves. A cylinder is secured in the piston which has a movable adjusting element consisting of at least two pistons of equal diameters secured together by a rod. The free end face of the first piston of the element is in open communication with the fluid acting on an end face of the working piston. The second groove communicates with a space which communicates with the free end face of the second piston. The first groove communicates, through a bore in the working piston, with the space between the first and the second piston. The first piston has at least one slot-shaped axially extending recess on its circumference which communicates with the space between the first and the second piston and which also opens

into an annular chamber in the inner wall of the cylinder. The chamber communicates, through an aperture in the cylinder wall, with a duct for removing fluid from the annular chamber.

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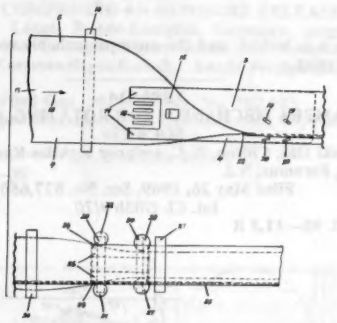
**3,585,907**
**PROCESS FOR MANUFACTURING VALVED AND GUSSETED SACKS FROM PLASTICS MATERIAL**
**Kurt Rochla, Lengerich, Germany, assignor to Windmoller & Holscher, Lengerich, Germany**
**Division of Ser. No. 487,277, Sept. 14, 1965, Pat. No. 3,555,973. Filed Sept. 18, 1969, Ser. No. 870,986. Claims priority, application Germany, Dec. 28, 1964, W 38,257**
**Int. Cl. B31b** *49/04;* **B31f** *7/00;* **B31b** *1/84*
**U.S. Cl. 93—35** **3 Claims**



A process is disclosed for manufacturing valved and gusseted sacks of plastic material commencing with a flat web of plastic and initially overlapping its edges and heat sealing to form a tube. A plurality of valved patches at spaced locations are sealed to the edge of one side of the web before the tube is formed and are joined to the other edge of the web during the formation of the heat-sealed seam. Thereafter, the tube is flattened with the heat-sealed seam spaced from both edges but closer to one. Finally, gussets are formed in the side edges of the tube in such a way that the heat-sealed seam lies at an outer gusset fold.

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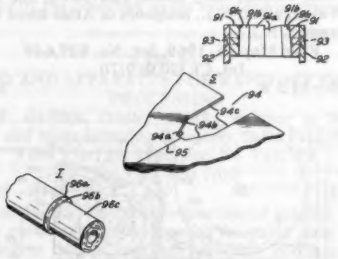
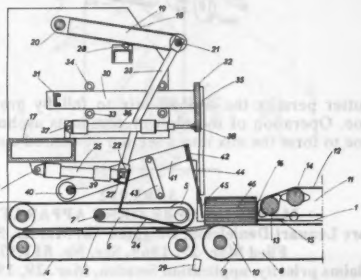
**3,585,908**
**CONVOLUTE TUBE WINDING MACHINE**
**Joseph Snyderman, Philadelphia, Pa., assignor to John Eppler Machine Works, Inc., Philadelphia, Pa.**
**Filed Apr. 1, 1969, Ser. No. 811,963**
**Int. Cl. B31b** *1/20;* **B31c** *1/08, 11/04*
**U.S. Cl. 93—81** **9 Claims**



A convolute tube winding machine is described with which tubes having portions of reduced diameter can be continuously produced, timed cutters being utilized for this purpose to sever and remove edge portions of the strip so that, upon winding, the reduced diameter portions occur at the locations of the severing and removal.

**3,585,909**
**APPARATUS FOR SEPARATING AND EVACUATING SHEET PRODUCTS**
**Rene Carrel, Lyon, France, assignor to Societe D'Etudes Et De Vente De Materials Pour La Fabrication Et Le Faconnage Du Carton Ondule-Martin, Rhone, France**
**Filed Feb. 24, 1969, Ser. No. 801,606**
**Claims priority, application France, Feb. 29, 1968, 141826**
**Int. Cl. B31b** *1/98;* **B65b** *57/20;* **B65b** *65/02*
**U.S. Cl. 93—93 D** **7 Claims**



An apparatus for separating and evacuating sheet products to produce packs by stacking from below, the sheet products being squared by reciprocating pallets and evacuated on to a conveyor belt, the apparatus including separating strips for introduction into the pack during assembly and a pusher to remove the assembled pack.

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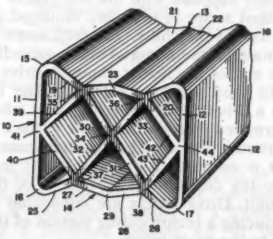
**3,585,910**
**EXPANSION JOINT AND BRIDGE JOINT SEALS**
**Delmont D. Brown, and Donald R. Boney, both of North Baltimore, Ohio, assignors to The D. S. Brown Company, North Baltimore, Ohio**
**Filed May 21, 1969, Ser. No. 826,311**
**Int. Cl. E01c** *11/10*
**U.S. Cl. 94—18** **6 Claims**



Invertible, elongated, elastomer joint sealing strips having substantially flat sidewalls, longitudinally corrugated or pleated top and bottom walls preferably of the same general configuration, and an internal web structure with one or two pairs of crossed webs connected to the top and bottom walls and additional diagonal webs extending diagonally across the four corners to provide two or three side-by-side diamond openings in internal structure of seals.

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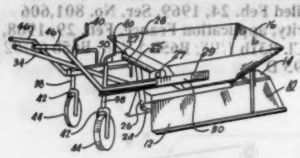
**3,585,911**
**CURBING APPARATUS**
**John Vlasic, 556 Edgeview St., New Kensington, Pa.**
**Filed Apr. 17, 1969, Ser. No. 817,002**
**Int. Cl. E01c** *19/48*
**U.S. Cl. 94—46** **5 Claims**

A curbing apparatus consisting of a manually operable wheeled vehicle for forming curb mix asphalt into a uniform curb. The vehicle carries a curb forming shoe with a hopper

thereabove and a manually controlled shutter and plunger. The asphalt mix is loaded into the hopper. Operation of the



shutter permits the asphalt mix to fall by gravity into the shoe. Operation of the plunger compacts asphalt mix in the shoe to form the mix into a section of desired curbing.

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**3,585,912**

**MATERIAL SPREADING APPARATUS**

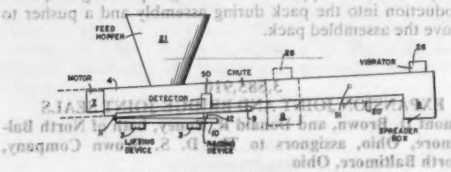
**Tore Lennart Danielsson, Dalgatan 7B, Marsta, Sweden**

**Filed Mar. 27, 1969, Ser. No. 811,174**

**Claims priority, application Sweden, Mar. 29, 1968, 4241/68**

**Int. Cl. E01c** *19/48*

**U.S. Cl. 94—46** **13 Claims**




Apparatus for spreading a material over a large surface has a material feeding unit including a feeder chute adapted to be continuously supplied with the material to be spread and in which a feed screw is rotatably mounted parallel to the longitudinal axis of the chute. The feed screw is arranged to convey the material to be spread into a spreading means provided at one end of the feeder chute. A drive motor is connected to the feed screw to rotate it. The feeding unit is mounted on a driving and supporting unit which is movable in a predetermined direction over the surface to be covered with the material. The unit has guide means on which the feeding unit is mounted for displacement in the direction transverse to the direction of movement of the driving and supporting unit. Drive means are connected to the feeding unit for producing a reciprocating motion of the feeding unit with respect to the guide means.

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**3,585,913**

**CAMERA WITH A COVER FOR PROTECTION OF OBJECTIVE AND OTHER ACTUATION ELEMENTS**

**Karl Heinz Lange, Bunde-Ennigloh, Westphalia, Germany, assignor to Balda Werke, Photographische Gerate und Kunststoff, R. Gruter Kommanditgesellschaft, Bunde, Westphalia, Germany**

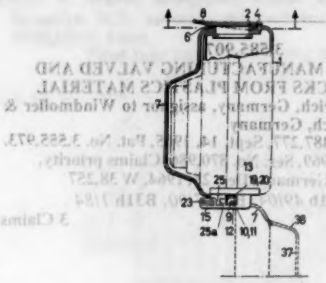
**Filed Oct. 7, 1968, Ser. No. 765,379**

**Claims priority, application Germany, Oct. 9, 1967, P 12 67 967.3–51**

**Int. Cl. G03b** *11/04, 17/02*

**U.S. Cl. 95—11** **10 Claims**

A camera provided with a hinged cover for protection of the objective and other elements. The cover has link pins for inserting the latter into a link bearing of the camera. The bearing has a gap at its circumference for inserting the link pins of the cover. When the link pins are inserted into the bearing, a movable supplement bearing part is released to automatically close the insert gap and thereby complete the hinge bearing. The movable bearing part can be shifted by hand against the action of a spring into an open position



where it is locked, and the cover detachably removed from the bearing.

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**3,585,914**

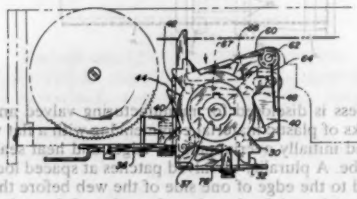
**CAMERA MECHANISM FOR ROTATING A LAMP SOCKET**

**Sukeyuki Oki, Clifton, N.J., assignor to Atlas-Rand Corporation, Paramus, N.J.**

**Filed May 26, 1969, Ser. No. 827,650**

**Int. Cl. G03b** *9/70*

**U.S. Cl. 95—11.5 R** **28 Claims**



A photographic camera mechanism having a rotatable socket adapted to receive and removably retain a multilamp photoflash unit. The mechanism rotates the socket between established limits and, during this rotation, the contact leads of one of the lamps is brought into contact with electrical contacts conductively connected to a battery source so as to ignite the photoflash lamp and provide light for the scene in front of the camera. A stop member is provided to insure that the photoflash unit is not accidentally rotated to cause an igniting of the photoflash lamp prior to an exposure operation of the camera. The camera shutter is actuated in response to and in synchronization with the rotation of the socket between the established limits.

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**3,585,915**

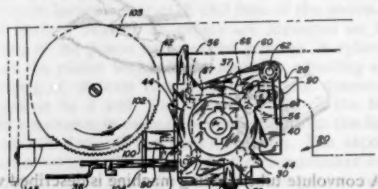
**FILM METERING MECHANISM FOR CAMERAS**

**Sukeyuki Oki, Clifton; Gary Kaess, Fair Lawn, and Edwin E. Faris, Wayne, all of, N.J., assignors to Atlas-Rand Corporation, Paramus, N.J.**

**Filed May 26, 1969, Ser. No. 827,649**

**Int. Cl. G03b** *9/70*

**U.S. Cl. 95—11.5 R** **30 Claims**



A film metering advance and flashcube socket mechanism for flash cameras includes a biased film perforation locator

disposed so as to engage a perforation of the film. As the film is advanced the locator enters the perforation and moves with the film to a stop position whereat the filmwind is stopped from further advance. A rotatable socket adapted to removably receive and retain a multilamp photoflash unit is engaged by a stop so as to be maintained in a fixed position until an exposure actuation is made by a finger-actuated kick lever. With the operation of the kick lever, the socket is released so as to be rotated for one-quarter of a revolution during which time the contacts of one of the lamps of the photoflash unit are brought into conductive engagement with a battery source in the camera. A lock or stop is provided and is disposed to engage the finger-actuated kick lever so as to prevent a double exposure from being made. The camera shutter is actuated in response to rotation of the socket.

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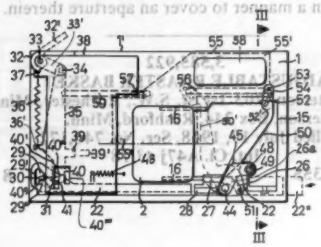
**3,585,916**

**CAMERA COMPRISING AN EXPOSURE RELEASE KEY**

**Karl Heinz Lange, Bunde-Ennigloh, Germany, assignor to Balda Werke Photographische Gerate und Kunststoff, R. Gruter Kommanditgesellschaft, Bunde/Westphalia, Germany**

**Filed Sept. 26, 1968, Ser. No. 762,693**
**Claims priority, application Germany, Oct. 17, 1967, P 15 97 126.3**
**Int. Cl. G03b *17/04***
**U.S. Cl. 95—39** **7 Claims**



A camera is provided with a retractable cover and a retractable objective, and the construction comprises a slide movable perpendicularly with respect to the optical axis. The slide has two cams shifted against each other, one controlling the support of the objective, the other cam controlling in its shifted position in timed relation to the first cam a flat cover plate covering the objective in the retracted position.

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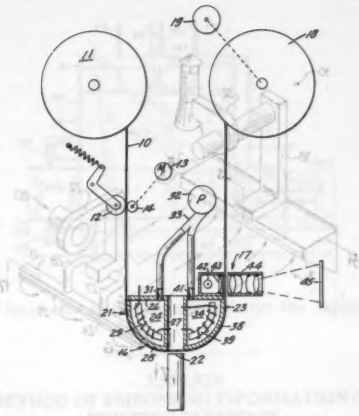
**3,585,917**

**METHOD AND APPARATUS FOR RAPID ACCESS FILM PROCESSING**

**Richard F. Griffith, Fridley, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.**

**Filed Mar. 18, 1968, Ser. No. 713,759**
**Int. Cl. G03d *7/00***
**U.S. Cl. 95—89** **11 Claims**

An apparatus for the rapid production of graphic information on a radiation-sensitive heat-developable strip material by exposing to radiant energy a smoothly continuously advancing strip, developing the strip material by a small efficient heating unit contiguous with the apparatus, and moving the developed material past an image-viewing station. The heating unit consists of a chamber member with a fine porous wall over which the strip material is moved and a resistance heater. Air is moved through the chamber and through the wall against the strip material at a rate to aerodynamically support the strip material from the wall and to afford convective heating of the strip material to a developing temperature.



The strip material is maintained at the developing temperature for a time sufficient to develop the strip material.

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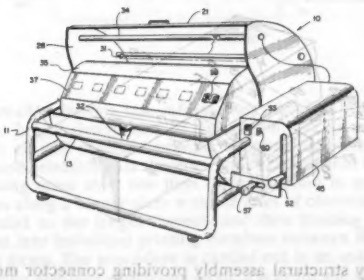
**3,585,918**

**PHOTOGRAPHIC PROCESSING APPARATUS**

**Richard C. Ball, Fairfax, Va., assignor to Potomac Research Incorporated, Baileys Crossroads, Va.**

**Filed Feb. 11, 1969, Ser. No. 798,345**
**Int. Cl. G03d *5/04***
**U.S. Cl. 95—93** **3 Claims**



There is disclosed an apparatus for printing or developing large mural size prints wherein an outer cylinder having an access opening is rotatably mounted in a frame. An inner cylinder having a flattened portion on its periphery is rotatably mounted within the outer cylinder and coaxial therewith. Clips are on the flattened portion to retain a sheet on the inner cylinder while it is rotated through a solution retained in the bottom of the outer cylinder. Mounted within the outer cylinder are spray nozzles to spray the inner cylinder with a liquid and a lamp assembly. A detent mechanism is provided to position the outer cylinder in a selected one of three operating positions. The outer cylinder is provided with a jacket through which a liquid is circulated to maintain solution within the outer cylinder at a constant temperature.

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**3,585,919**

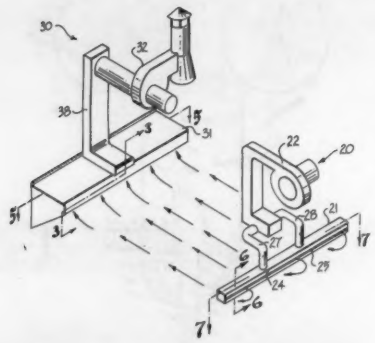
**FLUID HANDLING SYSTEM AND METHOD**

**Clifford Culpepper, Jr., Charlotte, N.C., assignor to Aero-Dyne Manufacturing, Inc., Charlotte, N.C.**

**Filed Apr. 30, 1969, Ser. No. 820,377**
**Int. Cl. F24f *13/00***
**U.S. Cl. 98—33** **8 Claims**

A fluid handling method and system in which fluid flow through a hollow casing is distributed in accordance with a

predetermined profile along an elongate slot in the casing of relatively high aspect ratio by the provision of internal flow diverting baffle means interposed between communicating



conduit means of relatively low aspect ratio and the slot and blocking direct fluid flow therebetween while diverting the flow into a predetermined profile along the slot.

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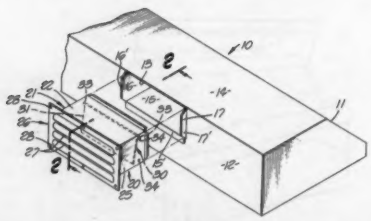
**3,585,920**
**ADJUSTABLE OUTLET FOR VENTILATING RANGE HOOD**
**Edwin F. Johnson, Fullerton, Calif., assignor to Jensen Industries, Inc., Los Angeles, Calif.**
**Filed June 16, 1969, Ser. No. 833,633**
**Int. Cl. F23j *11/00***
**U.S. Cl. 98—115** **1 Claim**



A unitary structural assembly providing connector means for use in mounting ventilating range hoods and the like in association with wall structure which may vary as to thickness, and which is particularly adapted for use with the thin walled structures of trailers. The assembly includes a sleeve with a louvered panel at one end, the other end of the sleeve being insertable through an opening of the associated wall and into telescoped relationship with an airflow channel in the hood structure, whereby the spacing between the louvered panel and the hood may be adjustably varied depending upon the thickness of the associated wall structure. The inner end of the sleeve is further provided with means for peripherally engaging the wall of the airflow channel, and a reverse flow air valve is provided in the sleeve of the assembly, which is normally moved to a closed position under the action of gravity.

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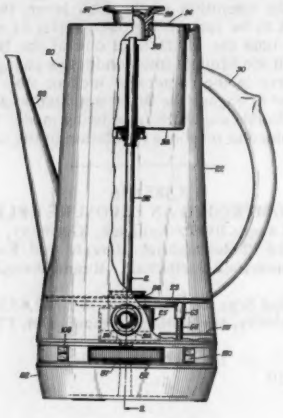
**3,585,921**
**APPARATUS FOR BREWING COFFEE**
**Farees Uddin Khaja, Chicago, Ill., assignor to Sunbeam Corporation, Chicago, Ill.**
**Filed Feb. 10, 1969, Ser. No. 797,924**
**Int. Cl. A47j *31/053***
**U.S. Cl. 99—280** **18 Claims**

An improved electric percolator including an electric timing arrangement for setting the percolator so that the brewing operation will commence at a selectable future time and said timing arrangement being compactly disposed within the percolator base. The particular stage of the percolator operating cycle can readily be determined by various visual



indicating means that are incorporated in this appliance. Moreover, the percolator is provided with an integral plastic lens which supports a signal light and locks itself to the percolator base in a manner to cover an aperture therein.

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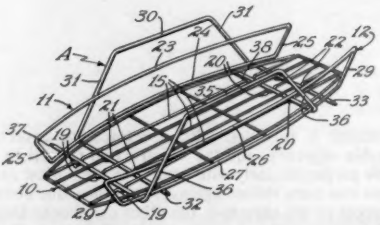
**3,585,922**
**ADJUSTABLE ROASTER BASKET**
**Hulda M. Peterson, 703 1st St. S.W., Rochester, Minn., and Don M. Peterson, Box 244, Rushford, Minn.**
**Filed July 19, 1968, Ser. No. 746,172**
**Int. Cl. A47j *43/18***
**U.S. Cl. 99—355** **8 Claims**



An adjustable roaster basket is described, adapted to support a turkey or other meat item while being roasted. The basket includes a bottom grill and a pair of side members. Each side member includes a pair of parallel horizontal rods at the lower end which is slidably supported by the bottom grill to increase or decrease the distance between the sides. When the basket is removed from the roaster and placed upon a serving platter, the sides may be removed to expose the turkey for carving.

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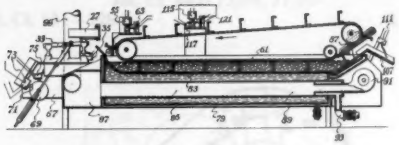
**3,585,923**
**AUTOMATIC FOOD FRYER**
**Leo R. Waller, 1229 N. Rosedale Ave., Tulsa, Okla.**
**Filed Oct. 21, 1968, Ser. No. 769,018**
**Int. Cl. A47j *37/12***
**U.S. Cl. 99—356** **2 Claims**

An automatic food fryer is provided with a feed conveyor that fills a weighing device that controls the feed. The

weighing device dumps a measured weight of food into the hot cooking oil, through which it is moved by an endless conveyor. The food discharges into a receptacle on a gated conveyor, the cycle being controlled by the feed of containers to that gated conveyor.



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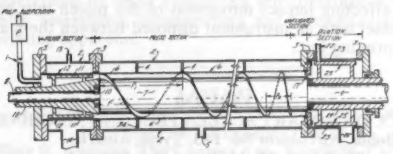
**3,585,924**
**APPARATUS FOR THE REMOVAL OF LIQUIDS FROM FIBROUS MATERIALS**
**William J. Nolan, 1029 N.E. 23rd Blvd., Gainesville, Fla.**
**Filed Mar. 10, 1969, Ser. No. 805,433**
**Int. Cl. B30b** *9/12*
**U.S. Cl. 100—43** **15 Claims**



An apparatus for removing liquid from a suspension of liquid and fibrous solids comprising a screw press which may have associated therewith a preliminary filtration section to remove a substantial amount of the liquid before the suspension enters the screw press, an unflighted section at the discharge end of the screw press for increasing the pressing effect, fingers at the discharge end of the screw press to stop rotation of the press cake and a dilution section for mixing a dilution liquid with the press cake, while excluding gas therefrom, so that as the fibers expand the dilution liquid is sucked into the fibers.

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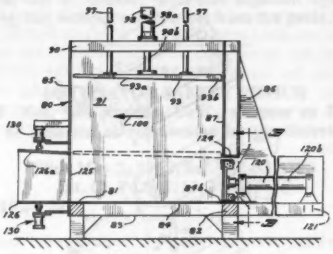
**3,585,925**
**COMPRESSION PACKING**
**Harold K. Fox, Minneapolis, Minn., assignor to Bemis Company, Inc., Minneapolis, Minn.**
**Filed May 28, 1969, Ser. No. 828,578**
**Int. Cl. B30b** *15/32*
**U.S. Cl. 100—218** **2 Claims**

A press for compressing resilient material having a frame, a stationary bottom press plate mounted in the frame, and a piston cylinder combination on the frame for moving a movable press plate between a datum position and a second position more closely adjacent the bottom plate and spaced therefrom. The above plates have adjacent, generally planar pressing surfaces with said surfaces diverging at least a slight amount in the direction that compressed product is to be moved in being ejected from between the plates when the movable plate is in its second position. There is provided a spout through which the compressed product is moved by a power operated pusher head that moves between the plates when the movable plate is in its second position. The pusher head has an extensible portion to move vertically as the presser head moves horizontally relative the tapered press plate.



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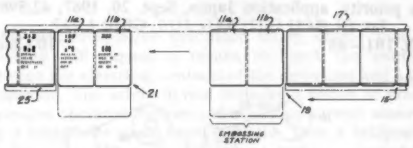
**3,585,926**
**METHOD OF EMBOSSING INFORMATION ON PRINTING ELEMENTS**
**Albert F. Wike, South Euclid, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio**
**Continuation-in-part of application Ser. No. 542,819, Apr. 15, 1966, now abandoned. This application Mar. 14, 1969, Ser. No. 812,549**
**Int. Cl. B44c** *1/00*
**U.S. Cl. 101—32** **2 Claims**



Small, relatively tall, information capsules, having a standard height determined by the system, are provided in the form of stiff sheetlike printing members or plates with embossed printable data thereon. They are prepared by first embossing more than one item of information in spaced locations along a longer plate with the lines of characters running parallel to the length thereof, and then dividing the longer plate into individual printing members between the information items. The procedure is carried out in an automatic embossing machine employing guide tracks for the top and bottom edges of the plates, and makes it possible to handle the work effectively even though the ultimate plate requires a dimension parallel to the lines of characters (i.e. parallel to the machine guide tracks) which would be substantially less than the height dimension, due to which the proportions of such ultimate plate would have been unsuitable for feeding reliably through the tracks of an automatic embossing machine if the plate had been embossed in its final configuration.

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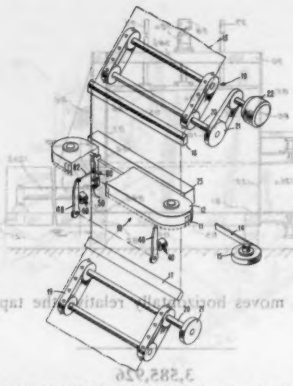
**3,585,927**
**PIVOTALLY MOUNTED HIGH PERFORMANCE PRINT MAGNET**
**Robert C. Burns, Conklin; John E. Drejza, Endwell; Donald F. Manning, Endicott; Richard L. Stark, Johnson City; Donald J. Stiles, Endwell; Joseph E. Wallace, and Joseph T. Wilson, III, Endicott, all of, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**
**Filed Dec. 22, 1969, Ser. No. 887,149**
**Int. Cl. B41j** *9/38, 7/84;* **H01f** *7/14*
**U.S. Cl. 101—93** **7 Claims**

In a high performance print magnet, magnet yokes are independently resiliently mounted on a common support, the yoke is tapered at the pole face to concentrate the flux at-

tracting the armature, and the push rod used to actuate a pivoted print hammer is spring biased to hold the magnet armature against a back stop and prevent the push rod from following the print hammer after the magnet armature seals.



**3,585,928**

**PRINTING PLATE MAKING MACHINE**

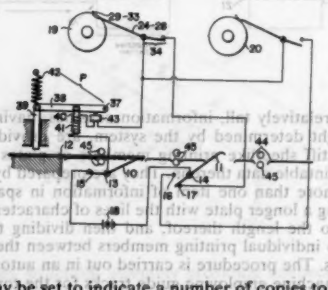
**Tamaki Kaneko, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan**

**Filed Sept. 12, 1968, Ser. No. 759,438**

**Claims priority, application Japan, Sept. 20, 1967, 42/59894**

**Int. Cl. B41j *5/02*; B41c *1/10*; G01d *15/12***

**U.S. Cl. 101—45** **10 Claims**



Dials may be set to indicate a number of copies to be made from a printing plate for an offset press. As the plate passes through a plate-making machine detectors note its arrival at a printing station where solenoid-activated printing or punching bars print or punch indicia on the plate at a location outside the portion of the plate to be printed. The position of the indicia is governed by the dial setting which determines which solenoid circuits are energized during a printing step. The indicia may be read by an attachment on the offset press, which is then set automatically to produce a desired number of copies from the printing plate.

**3,585,929**

**PLATEN ASSEMBLY FOR CHECK WRITERS**

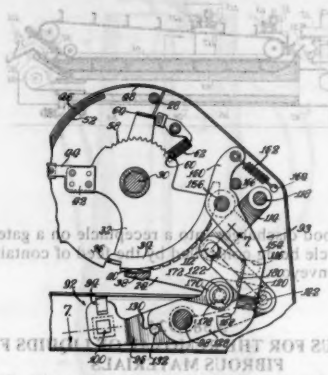
**Ardath A. Gopperton, Mount Prospect, Ill., assignor to Theodore B. Hirschberg, Jr., Chicago, Ill.**

**Filed Jan. 21, 1969, Ser. No. 792,469**

**Int. Cl. B41j *9/26***

**U.S. Cl. 101—95** **11 Claims**

A platen assembly for use with a money order printing machine or the like having a frame, means defining a printing line, type segments having printing characters positionable on the printing line and an operating lever. The platen assembly comprises a platen supported by rocker arms, and actuating mechanism means interconnecting the rocker arms with the operating lever. The actuating mechanism includes compression springs disposed between the rocker arms and the operating lever and control links adapted to selectively prevent rocking movement of the platen support arms. Initial movement of the operating lever toward a printing position



creates potential energy through compression of the springs, which energy is released as the operating lever is moved substantially to its printing position and releases the control links thereby effecting impact movement of the platen into pressure contact with an instrument disposed between the platen and the printing line.

**3,585,930**

**DEVICE ON ROTARY SCREEN PRINTING MACHINES**

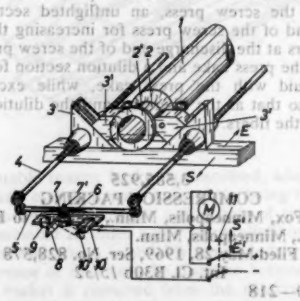
**Walter Bohm, Kirchbichl No. 143, Tyrol, Austria**

**Filed Sept. 23, 1968, Ser. No. 761,466**

**Claims priority, application Austria, Sept. 27, 1967, A 8757**

**Int. Cl. B41l *13/04***

**U.S. Cl. 101—116** **4 Claims**



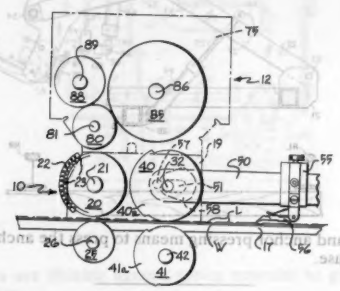
A device on rotary screen printing machines for longitudinally tensioning the rotary screens. The screen holders of at least one machine side being adjustable in parallel to the rotary screen axis wherein an adjustable device for the movable screens is provided. The adjustable device comprising stopping means, the stopping means limiting the movement of the screen holder to a predetermined extent upon release.

**3,585,931**

## LABEL IMPRINTING APPARATUS WITH A PLURALITY OF INTERCHANGEABLE SEPARATE SELF-CONTAINED INKING MODULES

**John A. West, and William R. Eppes, both of Charlotte, N.C., assignors to Idento Equipment Company, Charlotte, N.C.**

**Filed Mar. 20, 1969, Ser. No. 808,739**
**Int. Cl. B41f** *13/04, 31/30*
**U.S. Cl. 101—228** **2 Claims**



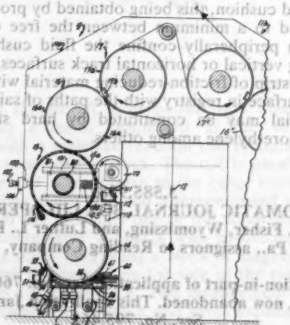
The combination of a label imprinting apparatus for successively printing serially arranged labels and the like connected together into a web of indeterminate length and a plurality of separate inking modules for selective, alternative, interchangeable use with the imprinting apparatus to supply a desired type of ink thereto. Each of the inking modules is characterized by being completely self-contained to provide ease in assembling, disassembling and interchanging in the imprinting apparatus.

**3,585,932**

## AUTOMATIC INKING SYSTEM FOR ROTARY NEWSPAPER PRINTING PRESS

**Wallace H. Granger, 106 Cypress Ave., Kentfield, Calif.**

**Continuation-in-part of application Ser. No. 650,453, June 30, 1967, now abandoned. This application June 7, 1968, Ser. No. 735,388**
**Int. Cl. B41f** *31/06*
**U.S. Cl. 101—350** **5 Claims**



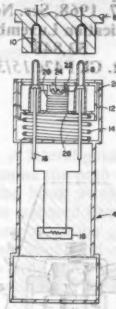
The invention relates to a rotary newspaper printing press in which there are an inking cylinder which receives ink from an ink fountain, an ink transfer cylinder, a plate cylinder and an impression cylinder. The inking cylinder preferably has an etched surface and it is provided with an ink fountain assembly that includes an ink control blade that accurately controls the thickness and uniformity of the film of ink. The ink transfer cylinder has a resilient pad to which ink is applied by the inking cylinder and which, in turn, applies a uniform film of ink to the plate cylinder. This ink transfer cylinder is provided with a clutch that automatically compensates for swelling of the pad and it is mounted so that it can be moved out of contact with the adjacent cylinders for machining, but without removing it from the press.

**3,585,933**

## DETONATOR SAFETY DEVICE

**Joseph T. Kos, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Army**

**Filed May 2, 1969, Ser. No. 821,200**
**Int. Cl. F42b** *3/12*; **F24b** *3/18*
**U.S. Cl. 102—28** **2 Claims**



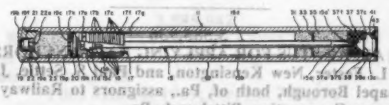
An electroexplosive detonator safety device that when operated will expand a means to block the connection between the electrical contacts of the detonator and a circuit connector. The safety device includes a piston to house an explosion operated bellows and a voltage current sensor having a bridgewire made more sensitive than a bridgewire of the detonator. When the detonator is to be connected to the circuit connector and a dangerous stray voltage or inadvertent firing current is present in the circuit, the voltage current sensor causes an explosion to expand the bellows and thus the bellows blocks any further insertion of the detonator into the circuit connector.

**3,585,934**

## UNDERWATER AMMUNITION

**Kenneth E. Mueller, Baltimore, and John L. Critcher, Cockeysville, both of, Md., assignors to AAI Corporation, Cockeysville, Md.**

**Filed Nov. 24, 1967, Ser. No. 688,646**
**Int. Cl. F42b** *13/54*
**U.S. Cl. 102—48** **14 Claims**



Underwater ammunition is disclosed, in which a flechette projectile is enclosed within the air-filled bore of a watertight sealed disposable barrel adapted to be removably inserted into a carrier cylinder or block for firing. The projectile is suspended by and between a rear-end-cradling pusher sabot, and a frangible guiding-and-supporting unit including a soft rubber nose-supporting cradle slug having a forward relieved surface. A propellant charge and percussion primer are disposed rearwardly of the pusher sabot which is initially anchored by a shear pin, and the projectile is propelled forward by primer ignition of the propellant to shear the shear pin and impart forward motion to the pusher sabot, which in

turn drives the projectile through a frangible sealed front barrel convexly domed cover. Forward motion of the sabot is stopped by successive incremental energy absorption through the shearing of an external helical shear thread on the forward section of the pusher sabot at the forward end of its travel, the shearing and compaction of which shear thread, as well as the resultant compaction of a soft malleable length of material in the thread grooves, also seals in the propellant gases within the barrel bore at the end of the sabot forward travel. One or more pressure dropping annular expansion grooves on the rear section of the pusher sabot are employed to obviate blowby of propellant gases during forward motion of the sabot.

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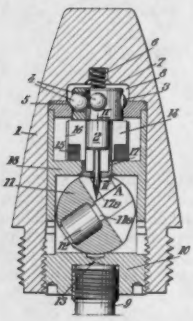
**3,585,935**
**PERCUSSION FUSE**

**Louis Birkigt, Pregny-Geneva, Switzerland, assignor to Brevets Aero-Mecaniques S. A., Geneva, Switzerland**

**Filed June 7, 1968, Ser. No. 735,399**
**Claims priority, application Luxembourg, June 9, 1967, 53,848**
**Int. Cl. F42c** *15/34*
**U.S. Cl. 102—79** **5 Claims**



The percussion fuse is intended to be mounted on a spin-stabilized projectile. The fuse includes a movable rotor subjected to the action of a retractable blocking member adapted to retain the rotor in its safety position, this blocking member being necessarily maintained in an active position by a centrifugal locking device of the percussion element of the fuse as long as this locking device remains operative; the release of this locking device permits the retraction of the blocking member under the action of return means, which retraction then permits the rotor to pass from its safety position to its armed position under the action of the centrifugal forces caused by the spin of the projectile.

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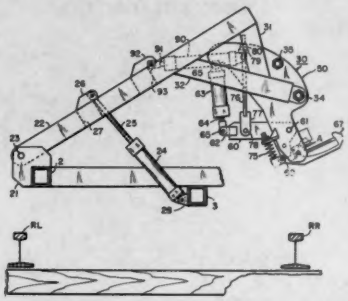
**3,585,936**
**APPARATUS FOR APPLYING RAIL ANCHORS**

**Carl L. Fester, New Kensington, and Paul S. Settle, Jr., Fox Chapel Borough, both of, Pa., assignors to Railway Maintenance Corporation, Pittsburgh, Pa.**

**Filed May 16, 1969, Ser. No. 825,362**
**Int. Cl. E01b** *29/32*
**U.S. Cl. 104—17** **9 Claims**

Apparatus for applying rail anchors to railroad track rails comprising a frame carrying rail wheels and having an anchor applying assembly pivotally mounted thereon. The anchor applying assembly having spaced heads, one of which is movable relative to the other and both of which are rotatable about one of the rods. Each head including means for carrying an anchor beneath a rail and hanging the anchor on the rail base including means for moving the anchor carrying means from an upper anchor loading position into a lower anchor hanging position. Means for moving one head relative to the other head to firmly hold the anchors against a tie or a



tie plate and anchor pressing means to press the anchors onto the rail base.

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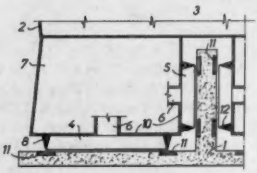
**3,585,937**
**TRANSPORT SYSTEM COMPRISING A TRACK AND A BODY MOVABLE THEREALONG**

**Jean Henri Bertin, Neuilly-sur-seine, France, assignor to Bertin & Cie, Plaisir, France**

**Filed Apr. 4, 1968, Ser. No. 718,765**
**Int. Cl. B60v** *3/04*
**U.S. Cl. 104—23 FS** **2 Claims**



An arrangement for reducing leaks in machine, chiefly ground effect machines such as vehicles running over or under a fluid cushion, this being obtained by providing a friction reduced to a minimum between the free edges of the walls which peripherally confine the fluid cushion and the cooperating vertical or horizontal track surfaces, as provided by laying a strip of friction-reducing material within or along the track surface in registry with the paths of said free edges. Said material may be constituted by hard steel, bronze, polytetrafluorethylene among others.

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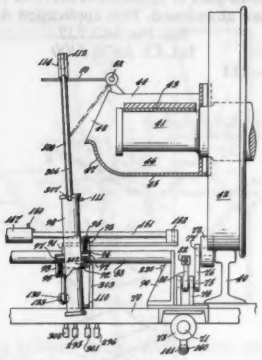
**3,585,938**
**AUTOMATIC JOURNAL BOX LID OPERATOR**

**Franklin G. Fisher, Wyomissing, and Luther L. Bollinger, Sr., Reading, Pa., assignors to Reading Company, Philadelphia, Pa.**

**Continuation-in-part of application Ser. No. 760,812, Sept. 19, 1968, now abandoned. This application Jan. 31, 1969, Ser. No. 795,462**
**Int. Cl. B61c** *17/00*; **E05f** *13/02*; **F01m** *11/00*
**U.S. Cl. 104—26 R** **25 Claims**

The invention relates to mechanism for automatically closing or opening the lids of journal boxes for lubricating railway cars. A bottom carriage is provided movable parallel to a railroad track, and by engaging an abutment by the car, the bottom carriage is caused to bear a predetermined relation to the journal box door. On the bottom carriage there is a top carriage moving toward and away from the track. The top carriage supports manipulator means, which opens or closes the door and operates on the trailing edge of the door. A

limiter is provided to prevent excessive opening of the door. The manipulator means is supported on trunnions and the



trunnions are slidable against spring restraint to go over an obstruction.

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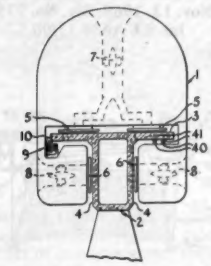
**3,585,939**
**LINEAR INDUCTION MOTOR FOR VEHICLE PROPULSION**

**Eric Roberts Laithwaite, Surbiton, and Denys Stanley Bliss, Comberton, both of, England, assignors to Tracked Hovercraft Limited, London, England**

**Filed Sept. 25, 1969, Ser. No. 860,948**
**Claims priority, application Great Britain, Sept. 26, 1968, 45727/68**
**Int. Cl. B61b** *13/00*
**U.S. Cl. 104—148 LM** **6 Claims**



A tracked Hovercraft is propelled by a linear induction motor having a stator connected to the vehicle which cooperates with a platelike reaction rail mounted along the length of a corner of the track. The rail is parallel with one track surface and is transverse to the other track surface of the corner. The stator has two interconnected parts on opposite sides of the rail, only one of the stator parts carrying electrically energizable windings with projecting end turns and the other stator part being a block of magnetic material. The block part is disposed on the side of the rail that forms an angle with a track surface. This arrangement enables the stator to be closer to the track and saves expensive reaction rail material.

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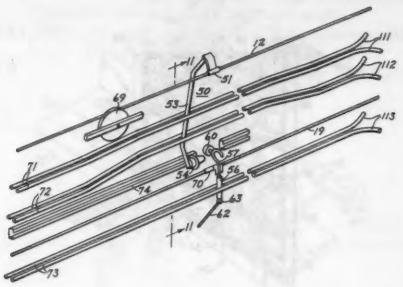
**3,585,940**
**WATER SKI TOW SYSTEM OR THE LIKE**

**John T. Hancock, Denver, Colo., assignor to Aqua Fun, Inc., Westminster, Colo.**

**Filed Oct. 6, 1969, Ser. No. 864,003**
**Int. Cl. B61b** *11/00*
**U.S. Cl. 104—173** **8 Claims**

A tow system for pulling water skiers around a course comprises a main driving cable extending about the course and driven at the desired speed and an accelerating cable for picking up a skier and bringing him to a speed approaching that of the main cable. A rigid driving bar member is suspended from the main cable and a rigid pickup hook fitting is attached to the skier's towline. At the loading station the driving bar enters guide members which prevent its lateral displacement, and the pickup fitting driven by the accelerating cable enters guide member which hold it in the



path of the driving bar. A lateral guide chute and a wheel on the pickup fitting determine the path of the pickup hook and the driving bar pulls the hook away from the accelerating cable when the wheel is released from the chute. At the unloading end of the course a similar guide system and chute are employed to maintain alignment of the bar and hook and the chute is sloped upwardly and away from the point of engagement and lifts the hook from the main cable bar.

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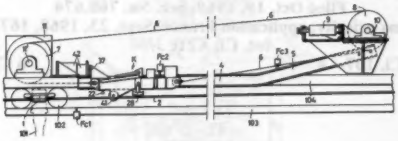
**3,585,941**
**CHECKING DEVICE FOR SINGLE AND DOUBLE CABLE CABLEWAYS WITH AUTOMATIC CLAMPING**

**Maurizio Primo, Milan, Italy, assignor to Ceretti & Tanfani, Milan, Italy**

**Filed Oct. 8, 1969, Ser. No. 864,820**
**Claims priority, application Italy, Feb. 3, 1969, 12374/69**
**Int. Cl. B61b** *11/02, 7/20*
**U.S. Cl. 104—173** **4 Claims**



In cableways in which each car is frequently coupled and decoupled from the traction cable by means of an automatic locking clamp arranged on the principal trolley, a device, independent of the coupling device arranged on the car trolley, for checking the grip of the car coupling clamp on the traction cable.

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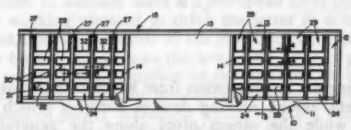
**3,585,942**
**RAILROAD BOXCAR SIDE CONSTRUCTION**

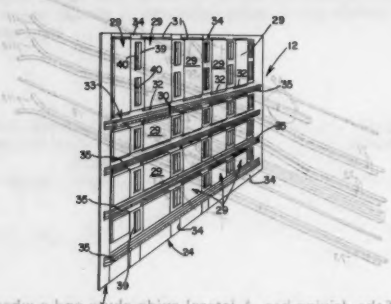
**William R. Shaver, Munster, Ind., assignor to Pullman Incorporated, Chicago, Ill.**

**Filed Feb. 11, 1969, Ser. No. 798,276**
**Int. Cl. B61d** *17/08, 45/00*
**U.S. Cl. 105—409** **3 Claims**



A boxcar side having a sidewall of single sheathed construction comprising a plurality of vertical sheets connected

to and disposed between side posts. The sheets are provided with inwardly pressed panels of rectangular dish-shaped configuration vertically spaced to provide therebetween a plurality of longitudinally extending areas in the original plane of the sheets and horizontally spaced to provide therebetween a plurality of vertically extending areas also in the original plane of the sheets with the several areas intersecting whereby to provide a waffle pattern on the inner side of the sidewalls. The horizontal areas have contained therein



anchoring members which extend continuously from each doorpost to respectively opposite ends of the car and to which cargo restraining beams may be connected. The anchoring members are disposed entirely within the areas so as to provide a generally flush inner side with the surface of said panels. The vertical areas are covered with a coverplate providing with said panels a smooth inner surface. The coverplates are apertured to provide access to lading strap anchor bars which are disposed in said vertical areas and which terminate short of said anchoring members.

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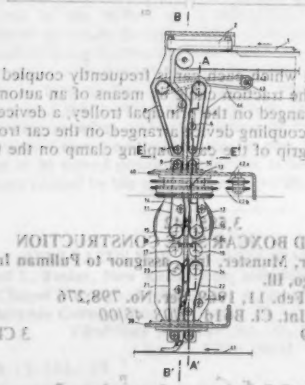
**3,585,943**

**MACHINE FOR TWISTING DOUGH**

**Pierre Tanguy; Pierre Carre, and Jean Le Boulbouech, all of 2 rue Bodelio, Lorient, France**

**Filed Oct. 18, 1968, Ser. No. 768,674**
**Claims priority, application France, Sept. 23, 1968, 167,181**
**Int. Cl. A21c** *3/08*
**U.S. Cl. 107—4** **6 Claims**



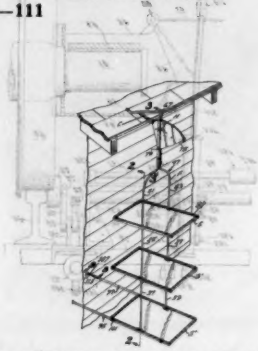
Machine for making twists from bands of puff paste which has several dough moving devices some of which are stationary while the others pivot along the general axis of passage of the dough in order to twist the band of dough on itself along its longitudinal axis between the stationary and the pivoting transport devices.

**3,585,944**

**SUSPENDED SHELVING**

**Lewis R. Scheer, 1726 N. Lagoon Ave., Wilmington, Calif.**

**Continuation-in-part of application Ser. No. 713,166, Mar. 14, 1968, now abandoned. This application Aug. 14, 1969, Ser. No. 863,737**
**Int. Cl. A47b** *5/00*
**U.S. Cl. 108—111** **9 Claims**



This application relates to shelving for suspension from the eaves of a roof. The suspended shelving includes a plurality of vertically spaced shelves which are carried on a frame having a hanger connected to the upper extremity thereof. The hanger includes a transversely projecting cleat for extension under the marginal extremity of the roofing and is formed with a plurality of claws for biting into the roof whereby the cleat may be inserted under the marginal edge of the roofing and secured to the roof without removal of such roofing.

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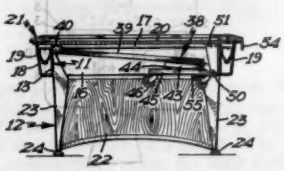
**3,585,945**

**POOL TABLE**

**Otto S. Nielsen, 4875 Sorrell Ave. North, Minneapolis, Minn.**

**Filed Nov. 12, 1968, Ser. No. 775,007**
**Int. Cl. A63d** *15/00*
**U.S. Cl. 108—111** **4 Claims**



A pool table is provided with a pair of leg structures which are pivotal between erect and collapsed positions. The leg structures support the table in the erect position and are folded against the table in the collapsed position. A mobile support structure is provided and includes a pair of wheel-supporting members each having wheels thereon and each being connected to the frame of the pool table for movement between operative and inoperative positions. The wheel mounting members when in the operative position rollably supporting the table after the table is turned upon one longitudinally edge thereof, thereby permitting ready and easy movement of the pool table.

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**3,585,946**

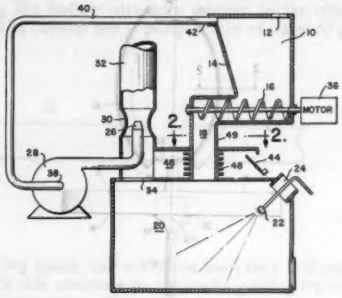
**INCINERATOR AIR SUPPLY AND LOADING MEANS**

**Ervin L. Dahlund, Long Beach, Calif., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Oct. 15, 1969, Ser. No. 866,710**
**Int. Cl. F23g** *5/08*
**U.S. Cl. 110—8 R** **7 Claims**

An incinerator capable of burning a large volume of all

types of combustible rubbish and waste material within a combustion chamber at a pressure slightly below atmospheric



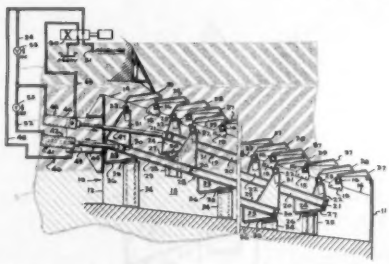

thereby lowering exhaust stack temperatures and effectively reducing air pollution to a minimum.

**3,585,947**

**STOKER CONSTRUCTION AND DRIVE SYSTEM THEREFOR**

**Miro Dvirka, Long Island City, N.Y., assignor to Hagan Industries Incorporated, Corona, N.Y.**

**Filed May 1, 1969, Ser. No. 821,560**
**Int. Cl. F23b *1/22***
**U.S. Cl. 110—38** **11 Claims**



A stoker for burning refuse in an incinerator including a support frame, a set of stationary grates mounted on the support frame, a first set of movable grates mounted on the support frame, a second set of movable grates mounted on the support frame and means for reciprocating the movable grates. The means for reciprocating the sets of movable grates comprises a pair of fluid cylinder assemblies operatively connected to the sets of movable grates, including means for assuring full strokes of the pistons of the fluid cylinder assemblies and, correspondingly, the sets of movable grates thereby providing an efficient stoking action.

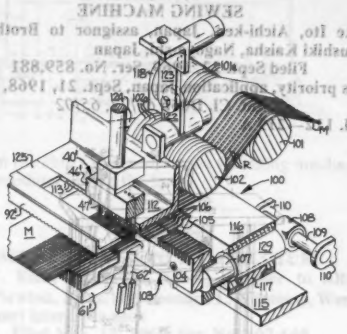
**3,585,948**

**TUFTING MACHINE FOR FORMING NARROW GAUGE PILE CARPETING**

**James T. Cobble, Dalton, Ga., assignor to B & J Machinery Co. Inc., Dalton, Ga.**

**Filed Nov. 17, 1969, Ser. No. 877,074**
**Int. Cl. D05c *15/12, 15/28***
**U.S. Cl. 112—79 R** **14 Claims**

A tufting machine characterized in its ability to form narrow gauge pile carpeting and particularly narrow gauge cut pile carpeting comprising means for feeding elongate backing material longitudinally along a predetermined path, first and second spaced-apart rows of tufting needles mounted for reciprocation in a direction transverse to the path of the backing material and arranged to carry yarn through the backing material, pile forming means disposed beneath the path of the backing material and operatively associated with each of the needles, and additionally including tracking means disposed between the first and second rows of needles for guiding the backing material from the first row of needles to the second row of needles so that the rows of tufts formed by the first row of needles pass through the spaces between



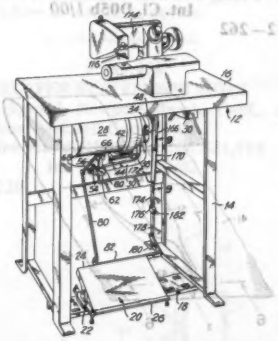

the needles of the second row of needles. Furthermore, the tracking means is mounted for lateral movement relative to the path of the backing material for effecting a corresponding lateral shifting of the backing material so that a zigzag pattern may be formed in the rows of tufts formed by said second row of needles.

**3,585,949**

**DEVICE FOR STOPPING A WORKING ELEMENT IN A GIVEN POSITION**

**Joseph Chudner, 2907 Brighton 8th St., Brooklyn, N.Y.**

**Filed Feb. 27, 1969, Ser. No. 802,806**
**Int. Cl. D05b *69/22***
**U.S. Cl. 112—219** **11 Claims**




A device for stopping a working element in a given position. For example, in the case of a sewing machine, the working element is a needle which should always be located in a given position displaced out of the work when the machine stops operating. The device includes a high-speed drive operatively connected with the working element to drive the latter at a relatively high speed during normal operation of the machine. In addition there is a low-speed drive connected with the working element to drive the latter at a relatively low speed, and the operator of the machine can switch over from the high-speed drive to the low-speed drive in preparation for stopping the operation of the machine. A blocking component coacts with the low-speed drive for blocking the transmission of power therefrom to the working element as soon as the latter reaches a given position so that the working element will remain in this latter position. Because the termination of the drive to the working element and the loca-

tion thereof in the predetermined stopped position takes place only when driving through the low-speed drive, the stressing of the machine components is reduced and the smoothness of the entire stopping operation is enhanced.

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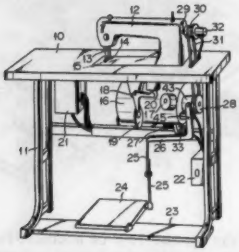
**3,585,950**
**SEWING MACHINE**
**Naotake Ito, Aichi-ken, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya-shi, Japan**
**Filed Sept. 22, 1969, Ser. No. 859,881**
**Claims priority, application Japan, Sept. 21, 1968, 43/68619**
**Int. Cl. D05b** *69/22, 65/02*
**U.S. Cl. 112—219 A** **8 Claims**



A sewing machine includes an electric driving system which moves a reciprocable needle to sew a work fabric pressed by a presser foot. The foot is automatically lifted after the needle is stopped at a predetermined position by the operation of a treadle, a time delay compensating for continued needle operation due to inertia of the mechanism.

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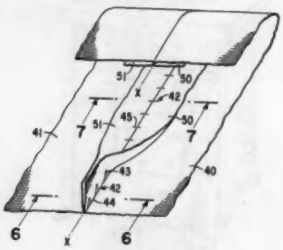
**3,585,951**
**METHOD OF PRODUCING A STITCHED SEAM**
**Frank J. Bartosz, Cranford, N.J., assignor to The Singer Company, New York, N.Y.**
**Filed June 29, 1970, Ser. No. 50,644**
**Int. Cl. D05b** *1/00*
**U.S. Cl. 112—262** **4 Claims**



The method of producing an opened (busted) stitched seam between two plies of fabric in which the fabrics in face-to-face relation are stitched together by a line of zigzag stitches which vary in bight from a base line, following which the fabric plies on both sides of the line of stitches are opened each ply being folded upon itself about the base line of the stitches.

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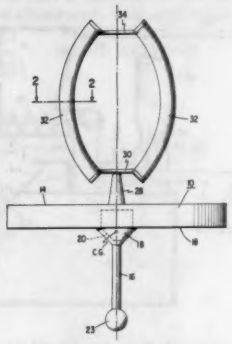
**3,585,952**
**SELF RIGHTING VESSEL**
**Victor P. Head, Cranbury, N.J., assignor to RCA Corporation**
**Filed Jan. 28, 1969, Ser. No. 794,588**
**Int. Cl. B63h** *9/00;* **B63b** *43/02*
**U.S. Cl. 114—39** **5 Claims**

A self-righting vessel is provided in which flotation means, which may comprise the sail of a sailing vessel, is so positioned and proportioned to the vessel that no matter what



position the vessel assumes as the result, for example, of winds or waves, the vessel will right itself.

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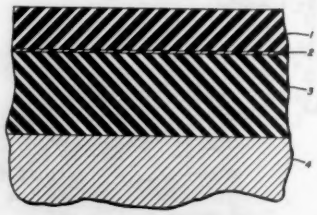
**3,585,953**
**MEANS AND METHOD FOR STABILIZING LAMINAR BOUNDARY LAYER FLOW**
**Max Otto Kramer, 15317 De Pauw, Pacific Palisades, Calif.**
**Filed June 20, 1969, Ser. No. 835,319**
**Int. Cl. B63b** *1/34*
**U.S. Cl. 114—67** **5 Claims**



The invention is directed toward dynamically responsive surface means for maintaining laminar boundary layer flow so as to reduce the frictional drag normally caused by turbulence in the fluid adjacent to a solid surface. By following the teachings of this invention which in its various practices may be applied to both, liquid and gaseous flow, it is possible to maintain a laminar boundary layer and the concomitant low drag coefficient under conditions where a turbulent boundary layer and the corresponding high drag coefficient would otherwise prevail.

A representative of the prior art in this field is the U.S. Pat. No. 3,161,385 which was granted to the same inventor on Dec. 15, 1964. The present invention has resulted from an uninterrupted research effort of the inventor aimed at the reduction to practice of the objectives expressed in the U.S. Pat. No. 3,161,385.

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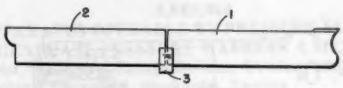
**3,585,954**
**METHOD OF MOVING SIDEWALL OF WATERTIGHT FLOATING BOX**
**Masataro Muto, and Yasuyuki Niimi, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**
**Filed Sept. 9, 1969, Ser. No. 856,402**
**Claims priority, application Japan, Oct. 8, 1968, 43/73421**
**Int. Cl. B63b** *3/02*
**U.S. Cl. 114—77** **4 Claims**

In a method of uniting, dividing, repairing, or maintaining under water portions of a floating body, such as a ship hull, the submerged work surfaces are enclosed by a watertight

floating caisson box including a bottom structure, extending horizontally and laterally beneath the floating body, and sidewall structures, adjacent the opposite ends of the bottom structure and extending upwardly to engage the sides of the floating body. At least one side structure is guided for movement along the bottom structure relative to the other side structure. The caisson box is pumped free of water to provide




a dry working space, and sufficient buoyancy is imparted to the movable side structure to reduce its guiding friction with the bottom structure. The movable side structure is then moved along the bottom structure to a selected working position, after which the buoyancy of the movable side structure is reduced to cause it to sink into watertight pressure contact with the bottom structure.

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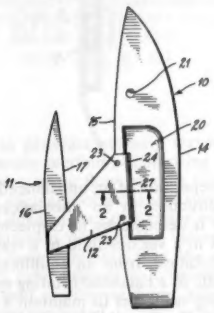
**3,585,955**

## ASYMMETRIC CATAMARAN

**Richard T. Cella, 3515 Ocean Drive South, Jacksonville Beach, Fla.**

**Filed Apr. 10, 1969, Ser. No. 815,054**
**Int. Cl. B63b** *43/14*
**U.S. Cl. 114—123** **4 Claims**




An asymmetric catamaran having a main hull and an outboard hull joined by a swept-back wing. The wing is attached to the main hull by bolts and by an inner flange seating in a groove in the inner surface of the sidewall of the main hull. The hulls and wing are composed essentially of fiber glass and polyurethane foam to provide lightness and buoyancy.

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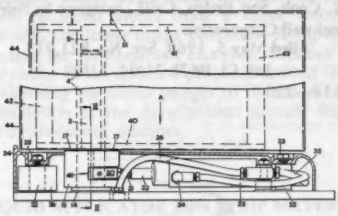
**3,585,956**

## STABILIZERS

**Roger Edward Gwynn, London; Michael John Turnham, London, and Alexander Arthur Tann, West Wickham, all of, England, assignors to Muirhead Limited, Beckenham, Kent, England**

**Filed May 23, 1969, Ser. No. 829,156**
**Claims priority, application Great Britain, May 29, 1968, 25,693/68**
**Int. Cl. B63b** *39/06*
**U.S. Cl. 114—126** **8 Claims**

A marine fin stabilizer for use with a small ship is provided with a plate for attachment to the outside hull of the ship and which carries the fin-tilting mechanism. Fluid pressure conduits extend from the mechanism through the plate to control equipment mounted inside the hull of the ship. The invention avoids the requirement for a fin shaft gland having to



be made in the ship's hull and for the fin-tilting mechanism to be accommodated inside the hull.

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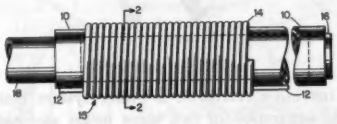
**3,585,957**

## SELF-FLEXING FINLIKE STRUCTURE

**Stanley R. Rich, Worcester, Mass., assignor to Alfred H. Rosen, Newton, Mass. and Leonard L. Krasnaw, Worcester, Mass., part interest to each**

**Filed Mar. 17, 1969, Ser. No. 807,649**
**Int. Cl. B63b** *3/38, 35/00*
**U.S. Cl. 114—140** **19 Claims**




A finlike structure has a plurality of tubular driving members in an elastomeric matrix biased so that under pressure applied to fluid in the driving members, members of one set of them flex to one side of the structure, and members of another set of them flex to the other side. Pressure is applied to one side or the other, or to both cyclically, to use the structure for various purposes, such as a gate, a valve, a motive device, a rudder or a sculling device.

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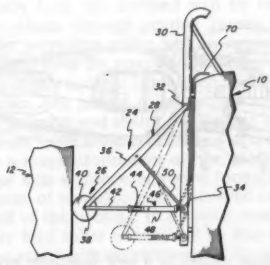
**3,585,958**

## BUFFER SYSTEM FOR SHIPS

**Bruno R. Naczkowski, Newport Beach, Calif., assignor to North American Rockwell Corporation**

**Filed May 5, 1969, Ser. No. 821,916**
**Int. Cl. B63b** *59/02*
**U.S. Cl. 114—220** **10 Claims**



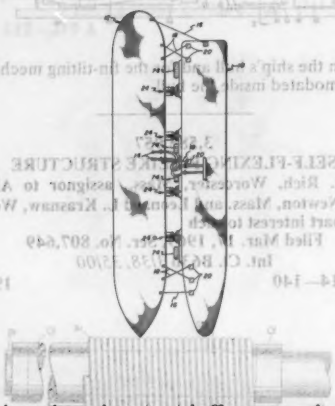

This invention relates to a buffer system that maintains adequate separation of two ships in an alongside mooring configuration; and will accommodate the relative motions of the two ships in a rough sea, to prevent the hulls from impacting. A plurality of inflated tires are biased in an outwardly movable direction to maintain the desired spacing; and these yield in a controlled manner that is established by inflation pressure, snubber design, mechanical linkage, and the like.

3,585,959

## BUFFER SYSTEMS FOR SHIPS

Robert G. Cook, San Pedro, Calif., assignor to North American Rockwell Corporation

Filed May 5, 1969, Ser. No. 821,917
Int. Cl. B63b *21/04, 21/00*
U.S. Cl. 114—220 6 Claims



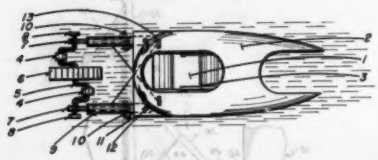
This invention relates to a buffer system that maintains adequate separation of two ships in an alongside mooring configuration; and will accommodate the relative motions of the two ships in a rough sea, to prevent the hulls from impacting. A plurality of inflated tires are biased in an outwardly movable direction to maintain the desired spacing; and these yield in a controlled manner that is established by inflation pressure, snubber design, mechanical linkage, and the like.

3,585,960

## WATER CYCLE

Shirley Dolores Shuler, 136 Ayrault St., North Tonawanda, N.Y.

Filed May 22, 1969, Ser. No. 826,876
Int. Cl. B63b *16/12*
U.S. Cl. 115—23 1 Claim



This invention relates to a new manually propelled watercraft with a hull either solid or hollow to act as a pontoon and platform with a paddle wheel, to provide a means for propelling the watercraft, detachably secured to the hull by means of two so spaced arms attached to the hull by means of laterally spaced pivot pins thus allowing horizontal movement of the arms thus providing one means of guidance.

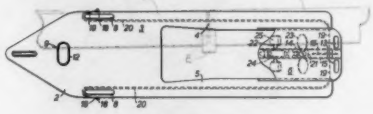
Another means of guidance is accomplished with ropes or wires attached to either a rudder at the aft end of the hull or to each arm at the forward part of the hull and running through the hull to the operator.

3,585,961

## MARINE PEDOMOTOR

Guy Alan Glover, Cummins Farm Stockland, Honiton, Devon, England

Filed Aug. 19, 1968, Ser. No. 753,495
Claims priority, application Great Britain, Aug. 23, 1967, 38751/67
Int. Cl. B63h *16/12*
U.S. Cl. 115—26.3 1 Claim



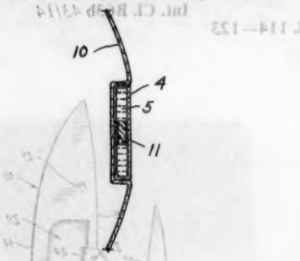
A water ski consisting of a board for supporting a prostrate person on the water surface and a pedal-operated propulsion means mounted beneath the board and adjustable in position according to the height of the person.

3,585,962

## WHEEL BALANCE INDICATOR

Karl O. Vartia, 5214 Grove Ave., Austin, Tex.

Filed July 11, 1969, Ser. No. 840,903
Int. Cl. G01m *1/00*
U.S. Cl. 116—114 2 Claims



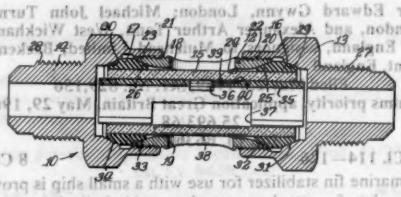
The cyclical repetition of an unbalanced accelerative force in a specific direction in an unbalanced rotating vehicle wheel assembly is detected by its displacement of a buoyant float, immersed in a viscous fluid in a transparent container at the axis of rotation, from an equilibrium position at the axis characteristic of a balanced rotating system, the viscosity of the fluid being sufficient to maintain a displaced position of the float while the assembly is brought to a stop, thus giving positive visual indication of unbalance as well as permitting an estimate of the direction and magnitude of the unbalanced force.

3,585,963

## FLUID INDICATOR

Jan A. Hiszpanski, Chicago, Ill., assignor to I-T-E Imperial Corporation

Filed June 18, 1969, Ser. No. 834,420
Int. Cl. G01f *15/00*
U.S. Cl. 116—117 19 Claims



A fluid indicator providing an indication of the absence or presence of a fluid in a system and the presence of moisture

in the fluid. The indicator includes means for connecting the same in a fluid line permitting fluid flow therethrough. The indicating means are carried within the indicator and are observable through suitable openings in the outer wall of the indicator. The indicator includes improved sealing means. Further, the indicator includes an improved visual indication of the absence of fluid in the indicator and an improved visual indication of the moisture condition thereof.

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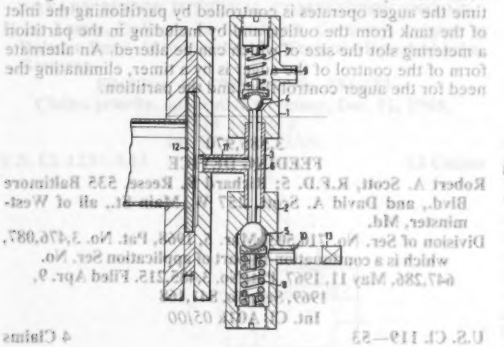
**3,585,964**

## APPARATUS OPERABLE BY PRESSURE FLUID TO GENERATE PRESSURE WAVES IN A MEDIUM

**Per Olof Skoldberg, Saltsjo-Duvnas, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden**

**Filed May 27, 1969, Ser. No. 828,157**
**Claims priority, application Sweden, June 4, 1968, 7474/1968**
**Int. Cl. G10k *5/00*; F15b *11/08*; E03b *3/00***
**U.S. Cl. 116—137** **4 Claims**



An apparatus to generate pressure waves in a preferably liquid and/or gaseous medium, comprising a system of two valves arranged in a cycle flow conduit for a pressure fluid with one valve at each end of a channel surrounding a movable spacer rod so dimensioned that either one of the valves is always in open position. One of the valves is arranged for being opened by lesser pressure than the other. From said channel a branch tube extends to a membrane in contact with a medium, said membrane being adapted to transmit pressure variations generated in the valve system to said medium in the form of pressure waves.

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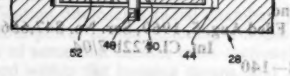
**3,585,965**

## DEVELOPMENT CHAMBER

**Alfred F. Kaspaul, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.**

**Filed Jan. 9, 1969, Ser. No. 789,997**
**Int. Cl. B05c *11/00***
**U.S. Cl. 118—9** **5 Claims**




The development chamber comprises first and second spaced discs around which a flexible medium to be developed is wrapped around a major portion of the disc circumferences. The medium to be developed has a latent image thereon, which latent image is developed by selective acquisition of metal atoms from a vapor source, in accordance with the latent image character. A vapor source is placed inside the development chamber, between the discs, the discs rotate as the medium proceeds around the circumference exposing the latent images to the metal vapor, and upon completion of the development process moves away from the development chamber.

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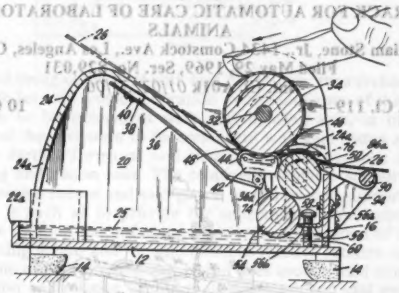
**3,585,966**

## LIQUID APPLICATOR FOR STRIP MATERIAL

**Oscar K. Hill, Agincourt, Ontario, Canada, assignor to Better Packages, Inc., Shelton, Conn.**

**Division of Ser. No. 681,654, Nov. 9, 1967, Pat. No. 3,468,287.**
**Filed Jan. 6, 1969, Ser. No. 840,545**
**Int. Cl. B05c *1/08***
**U.S. Cl. 118—262** **2 Claims**



A label gluing or moistening device includes a housing forming a reservoir or well for the liquid such as glue. The housing is closed by a cover defining an inclined wall for the reception of a label to be moistened and which may be fed between a rotatable rubber-coated roller and a pair of biasing rollers which are mounted on the interior of the cover and biased upwardly against the rubber-coated roller. Labels are fed downwardly from the inclined wall by rotation of the rubber roller which through gearing causes rotation of a reservoir roller or pickup roller and an applicator roller to pick up the liquid from the reservoir and transfer it to the applicator roller over which the label is fed by the movement of the rubber roller. The pickup roller and the applicator roller are mounted such that end shaft portions may be slipped into or removed from vertical grooves defined in the housing, and they include a tongue formation on the shafts on one side which engages into a groove or recess formation formed as shaft projections of rotatable gears mounted on the exterior of the sidewall of the housing. In a similar manner, the shaft for the rubber feed roller is mounted so that it may be engaged or disengaged with an extension of its associated gear for driving the applicator and transfer roller gears, the whole arrangement being such that the cover with the feed roller and the two separate pickup rollers and applicator rollers may be easily removed from the housing for cleaning or adjustment of the parts as necessary. The device also includes an extension supporting a bar upon which is carried a plurality of rotatable fingers which may be arranged so that they abut against the surface of the applicator roller and insure that the label which is fed thereover is picked off at the exit end of the housing and delivered over the surface of the fingers for removal and use.

3,585,967

## ARTIFICIAL SEA WATER SOLUTION AND COMPOSITION FOR PRODUCING THE SAME

William E. Kelley, Euclid, and Richard M. Segedi, Cleveland, both of, Ohio, assignors to Aquarium Systems, Inc., Wickliffe, Ohio

Continuation-in-part of application Ser. No. 7,816,55, Sept. 20, 1968, now abandoned , which is a continuation of application Ser. No. 423,604, Jan. 5, 1965, now abandoned. This application Mar. 12, 1969, Ser. No. 843,865

Int. Cl. A01k *61/00*

U.S. Cl. 119—3 9 Claims

An artificial sea water solution and a solid composition for making such a solution by dissolving in water. The composition includes two parts, the first part constituting about 99.9 weight percent of the total weight of the composition and contains basic salts. The second part of the composition is a solution of trace elements and constitutes about 0.1 weight percent of the total weight of the composition. The solution includes, in addition to water, the following ions: sodium, magnesium, calcium, potassium, strontium, manganese, lithium, aluminum, rubidium, zinc, cobalt, copper, chloride, sulfate, carbonate, orthophosphate, molybdate, thiosulfate, bromide, iodide and gluconate.

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3,585,968

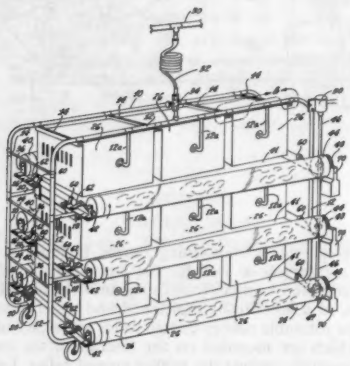
## RACK FOR AUTOMATIC CARE OF LABORATORY ANIMALS

William Stone, Jr., 1434 Comstock Ave., Los Angeles, Calif.

Filed May 29, 1969, Ser. No. 829,031

Int. Cl. A01k *01/02*, *31/00*

U.S. Cl. 119—22 10 Claims



An improved rack is provided for removably supporting a battery of animal cages and which may include, for example, means for providing drinking water in each cage; and which also includes a moveable membrane, plastic sheet, or the like, which is drawn under each row of cages in the rack for receiving droppings from the cages. The sheet is drawn along a path under the row of cages from a reel on one side of the cages to a reel on the other side. When the sheet becomes completely reeled on the latter reel, it may be removed and disposed.

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3,585,969

## DEMAND LIQUID FEED STATION

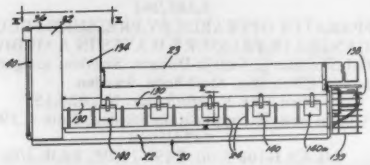
Edward J. Crane, Ottumwa; Ralph F. Koch, Inwood, and Edvin O. Neimeyer, Rock Valley, all of, Iowa, assignors to U. S. Industries, Inc., New York, N.Y.

Filed June 16, 1969, Ser. No. 833,437

Int. Cl. A01k *05/00*, *05/02*

U.S. Cl. 119—51.5 21 Claims

A demand-feeding apparatus for automatically supplying dry feed and a liquid to a trough, the feed being supplied by an auger in a channel having holes therein above the trough, the openings of the holes being adjustably controlled. A tank supplies the liquid from an inlet to which it is connected by emptying substantially all of its liquid contents when a float in the trough drops so as to actuate a limit switch. A float in the tank drops as the tank empties, thereby activating the motor driving the auger. The inlet of liquid to the tank is



controlled by a float such as in a flush tank. The length of time the auger operates is controlled by partitioning the inlet of the tank from the outlet, and by including in the partition a metering slot the size of which can be altered. An alternate form of the control of the auger is by a timer, eliminating the need for the auger control float and the partition.

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3,585,970

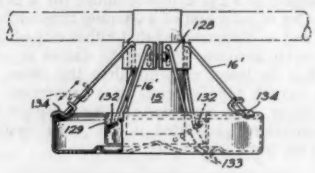
## FEEDING DEVICE

Robert A. Scott, R.F.D. 5; Richard R. Reese, 535 Baltimore Blvd., and David A. Scott, 257 W. Main St., all of Westminster, Md.

Division of Ser. No. 710,503, Mar. 5, 1968, Pat. No. 3,476,087, which is a continuation-in-part of application Ser. No. 647,286, May 11, 1967, Pat. No. 3,485,215. Filed Apr. 9, 1969, Ser. No. 841,168

Int. Cl. A01k *05/00*

U.S. Cl. 119—53 4 Claims



A feeding device having a supply hopper connected to a feed line conveyor of the axially expanding helical auger type. A suspension system including load dividing floor supports for adjustably supporting the device with respect to the ground, and in addition, the feed line is provided with a plurality of spaced feeding stations in the form of feeding pans each having an adjustable feed flow.

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3,585,971

## STEAM GENERATING SYSTEM

Ernest R. Muckelrath, Tioga, N. Dak., assignor to Air Heaters, Inc.

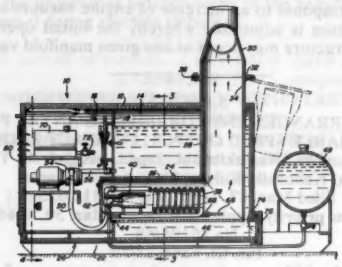
Filed Aug. 5, 1969, Ser. No. 847,656

Int. Cl. F22b *7/04*

U.S. Cl. 122—140 19 Claims

A steam generating system comprising an enlarged water tank receiving an elongated fire tube therethrough. The fire tube has a burner and steam coil mounted on a movable frame therein and selectively retractable therefrom into an enclosed control room provided at one end of the water tank

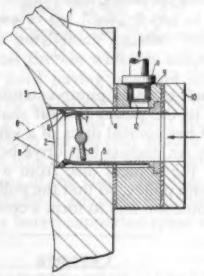
and including controls, pump means, cleaning means, and the like. The fire tube acts so as to preheat the water subsequently pumped from the tank and through the steam generating coil for ultimate discharge from the system.



### 3,585,972
### ROTARY PISTON INTERNAL COMBUSTION ENGINE

**Heinz Lamm, Esslingen-St. Bernhardt, Germany, assignor to Daimler-Benz Aktinegesellshaft, Stuttgart-Unterturkheim, Germany**

**Filed Dec. 11, 1969, Ser. No. 884,123**
**Claims priority, application Germany, Dec. 12, 1968, P 18 14 234.2**
**Int. Cl. F02b** *53/04*
**U.S. Cl. 123—8.13** **12 Claims**



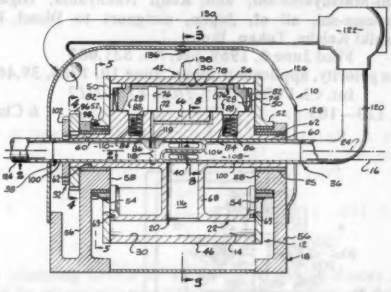
A rotary piston internal combustion engine, especially of trochoidal construction, in which an inlet channel which is provided within a housing case, has its control aperture disposed in the contact surface of the housing case for the piston; by the use of a sleeve partially or completely lining the inlet channel a narrow annular space is formed between the outer wall of the sleeve and the wall of the inlet channel; the annular space is in communication with the inlet channel by several discharge apertures disposed essentially in the axial direction of the inlet channel in proximity of the control aperture thereof.

### 3,585,973
### RADIAL CHAMBER POSITIVE-DISPLACEMENT, FLUID POWER DEVICE

**John J. Klover, La Puente, Calif., assignor to General Management Company, North Hollywood, Calif., a part interest**

**Continuation-in-part of application Ser. No. 553,227, May 26, 1966. This application Feb. 13, 1969, Ser. No. 805,936**
**Int. Cl. F02b** *53/04, 55/08;* **F01c** *19/02*
**U.S. Cl. 123—8.45** **29 Claims**

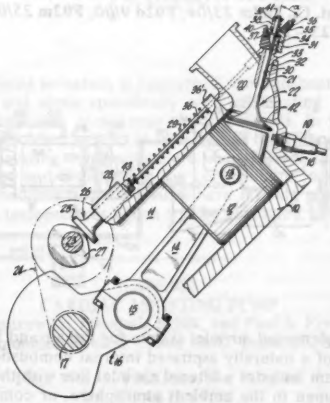
The specification discloses a radial chamber, positive displacement, fluid power device including a housing means, a piston means of somewhat smaller cross-sectional configuration positioned within the housing means, and vane means between the housing means and the piston means and sealingly cooperable therewith for defining two or more angularly adjacent inner chamber spaces of a complete chamber defined within the housing means. The housing means and the piston means are both supported by a pair of relatively eccentrically related supporting means having two eccentrically related spaced substantially parallel axes referred to herein as a housing axis and a piston axis and coaxial, respectively, with a corresponding actual axis of said housing means (usually substantially centrally disposed of said housing means although not specifically so limited in all cases) and a corresponding actual axis of said piston means (usually substantially centrally disposed of said piston means, although not specifically so limited in all cases). Said supporting means may also be said to have an axis of operation substantially parallel to said housing axis and said piston axis and positioned in a plane terminating at one end and being coincident with said housing axis and terminating at the other end and being coincident with said piston axis, thus making it possible for said axis of operation in certain forms of the invention to be coincident with said housing axis, in other forms of the invention to be coincident with said piston axis, and in further forms of said invention to lie between said housing and piston axes. The relatively rotatable support of said housing means and said piston means by said supporting means is such as to provide for substantially simultaneous relative rotation thereof around said axis of operation of said supporting means and for simultaneous relative rotation of at least one of said housing and piston axes around said axis of operation and relative to said housing means and said piston means in an opposite direction in a manner such as to effect cyclic contraction and expansion of the chamber spaces without any substantial relative angular movement between said piston means and said housing means occurring.



### 3,585,974
### VALVE ACTUATING MECHANISM

**Robert L. Weber, 49 Clapboard Hill Road, New Canaan, Conn.**

**Filed Feb. 28, 1969, Ser. No. 803,164**
**Int. Cl. F01l** *1/04, 1/30, 1/32*
**U.S. Cl. 123—90.12** **51 Claims**



The invention contemplates a valve-actuating system wherein purely longitudinal displacement is achieved upon

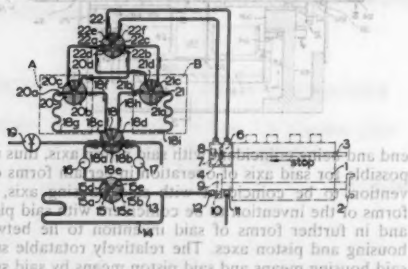
relative rotation of members in coaxial, helically cammed relation. A number of different embodiments are disclosed whereby the desired rotation is effected, and illustrative employments are described for valve actuation derived from various cam structures, including a cam with spring-loaded follower, and a desmodromic cam, as well as block-mounted and overhead camshaft forms thereof.

**3,585,975**

## FLUID-OPERATED RPM REGULATOR FOR INTERNAL COMBUSTION ENGINES

**Hiroshi Tonegawa, Kawagoe-shi; Tadayuki Kawasaki, Higashi-Matsuyama-shi, and Kenji Nakayama, Higashi-Matsuyama-shi, all of, Japan, assignors to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan**

**Filed June 6, 1969, Ser. No. 831,085**
**Claims priority, application Japan, June 10, 1968, 39,460**
**Int. Cl. F02d *11/08, 1/02;* F15c *1/12***
**U.S. Cl. 123—103** **6 Claims**



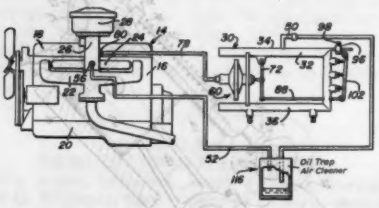
In a fluid-operated r.p.m. regulator, in which the output channels of a fluid amplifier element carry r.p.m.-proportionate pressures applied to both sides of a fuel control rod to displace the same for varying the r.p.m., the transitional period between the moment of change (e.g. increase or decrease in the engine load) and the moment of stabilization of the automatically adjusted new r.p.m. is decreased by the provision, between said amplifier element and said rod, of components which respond to a change in said r.p.m.-proportionate pressures by generating an output flow of increased pressure in one of the output channels of a component and switching said output flow to another output channel thereof after a predetermined interval.

**3,585,976**

## MANIFOLD VACUUM CONTROLLED SUPPLEMENTAL AIR INLET WITH AIR FILTERING MEANS

**Paul M. Rider, P.O. Box 1369, Wewoka, Okla.**

**Filed Oct. 13, 1969, Ser. No. 865,895**
**Int. Cl. F02m *23/04;* F02d *9/00;* F02m *25/06***
**U.S. Cl. 123—124** **8 Claims**



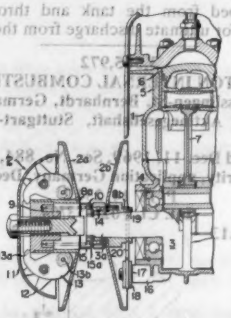

A supplemental air inlet system for the air and fuel intake passage of a naturally aspirated internal combustion engine. The system includes a filtered air inlet line with the inlet end thereof open to the ambient atmosphere, or communicated with the interior of the crankcase of an associated internal combustion engine, and the outlet end thereof communicated with the air and fuel intake passage of the engine. Manifold vacuum controlled valve structure is provided and operatively associated with the inlet end of the line and is operative to increase the flow of air or crankcase vapors into the line in response to an increase of engine vacuum and the valve structure is adjustable whereby the initial opening of the valve structure may occur at any given manifold vacuum.

**3,585,977**

## DRIVE ARRANGEMENT FOR DRIVING AN OIL PUMP OF VARIABLE SPEED OUTPUT, COMPACT ENGINES

**Yutaka Masaoka, Hamakita-shi, Japan, assignor to Yamaha Halsudoki Kabushiki Kaisha, Shizuoka-ken, Japan**

**Filed Mar. 27, 1969, Ser. No. 811,035**
**Claims priority, application Japan, Mar. 30, 1968, No.25106/68**
**Int. Cl. F16n *13/10***
**U.S. Cl. 123—196** **3 Claims**



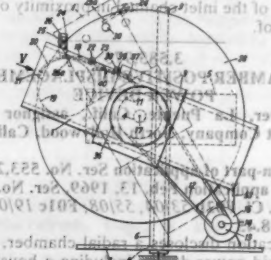
The input shaft of an oil pump extends from the pump casing in parallel to the power takeoff shaft of a two-cycle engine. The shaft has conical discs of a variable speed drive attached thereto. An endless-belt drive belt is stretched within the outline of the conical disc from a pulley on the drive shaft to the pump pulley, so that the pulleys are placed inside the disc for protection and to form a compact structure.

**3,585,978**

## CENTRIFUGALLY OPERATED BALL PROJECTING DEVICE

**Paul Hurlimann, Zentralstrasse 64, CH 5430 Wettingen, Switzerland**

**Filed Apr. 12, 1968, Ser. No. 720,920**
**Claims priority, application Switzerland, Apr. 19, 1967, 5587/67**
**Int. Cl. F41b *3/04***
**U.S. Cl. 124—6** **19 Claims**



Apparatus for throwing tennis balls or the like comprises a barrel rotatable about a horizontal axis which intersects the barrel axis. The barrel has an inlet whose center is located on the horizontal axis. A blocking device in the barrel is actuated at variable intervals to permit a ball which enters the barrel by way of the inlet to issue from one end of the barrel

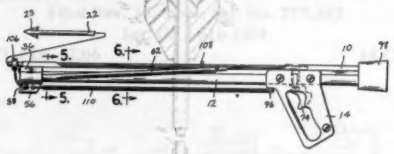
by centrifugal force. The barrel is turnable about a vertical axis to change the planes of trajectories of balls and is rotated by a variable-speed drive so that the operator can change the trajectories independently of the angular position of the barrel during ejection of balls.

**3,585,979**

**UNDERWATER SPEAR GUN WITH ELASTIC PROPELLING MEMBER**

**Grover E. Hendricks, 2241 Lake St., Niles, Mich.**

**Filed Dec. 23, 1968, Ser. No. 785,962**
**Int. Cl. F41b *7/04***
**U.S. Cl. 124—22 R** **3 Claims**



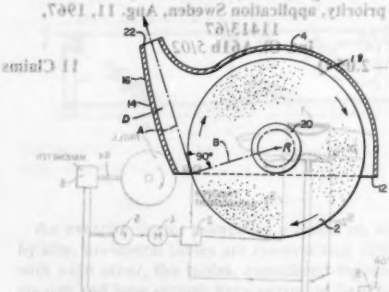
An underwater spear gun having an elongated barrel adapted to support a spear and an elastic member having a forward end portion anchored by an end member to the forward end of said barrel and having a rearward end portion adapted to releasably engage said barrel supported shaft. The end member is secured to the forward end of the spear gun barrel and includes a part which projects below the barrel and which has a recess therein which is adapted to receive portions of a coiled cord having one end attached to the spear and the other end preferably attached to a convenient location on the spear gun. The end member includes a pair of depending lug parts which are laterally spaced from opposite sides of the barrel and which extend below and rearwardly of the point of securement of the elastic member to the barrel. The barrel has a longitudinal groove formed therein which is adapted to receive the barrel supported spear shaft in sliding engagement.

**3,585,980**

**METHOD AND DEVICE FOR REMOVING MORTAR OR THE LIKE FROM BETWEEN SUPERIMPOSED ROWS OF BRICKS OR THE LIKE**

**Fred Mellor, 25 Stamford St., Mossley, England**

**Continuation of application Ser. No. 484,878, Sept. 3, 1965, now abandoned. This application Feb. 20, 1969, Ser. No. 805,960**
**Int. Cl. B28d *1/04*; B24b *55/04*, *1/00***
**U.S. Cl. 125—13** **11 Claims**



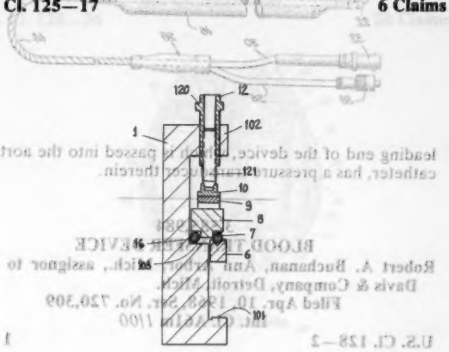
A method of removing mortar from between the rows of superimposed bricks while collecting the dust generated thereby and a blade guard for a grinding disc with a tangential dust outlet.

**3,585,981**

**HIGH-PRECISION UNIFORM CLAMPING DEVICE**

**Etienne Ombredane, Paris, France, assignor to CSF Compagnie Generale De Telegraphic Sans Fil**

**Filed Dec. 6, 1968, Ser. No. 781,871**
**Claims priority, application France, Dec. 18, 1967, 132699**
**Int. Cl. B25b *1/16*; B28d *1/06***
**U.S. Cl. 125—17** **6 Claims**



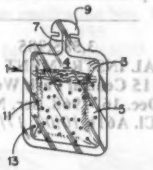
A clamping device in which the clamping forces are exerted by clamping screws through the medium of deflecting members. The measurement of these forces being effected by measuring the deflection of said members. For achieving a uniform clamping, a first beam which is capable of pivoting about one of its edges and another beam which can pivot with respect to the other edge of the first beam are interposed between the deflecting members and the part which is clamped.

**3,585,982**

**SELF-HEATING COMPOSITION**

**James A. Hollinshead, Winchester, Mass., assignor to The Gillette Company, Gillette Park, Boston, Mass.**

**Filed June 25, 1969, Ser. No. 836,314**
**Int. Cl. F24j *1/00***
**U.S. Cl. 126—263** **17 Claims**



The present invention is concerned with self-heating compositions and more specifically with self-heating cosmetic compositions such as aqueous shaving creams. In the compositions disclosed herein, at least one of the components of a heat-generating combination are encapsulated in ruptura-ble capsules and dispersed in the composition. In especially useful embodiments, the capsules have melting points at or below the temperatures which will be generated in the composition.

**3,585,983**

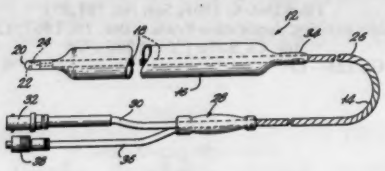
**CARDIAC ASSISTING PUMP**

**Adrian Kantrowitz; Wladimir Schilt, and Paul S. Freed, all of c/o Maimonides Medical Center 4802 Tenth St., Brooklyn, N.Y.**

**Filed Mar. 5, 1968, Ser. No. 710,596**
**Int. Cl. A61b *19/00***
**U.S. Cl. 128—1** **6 Claims**

An intra-arterial cardiac assisting device is provided having

a nonelastic polyurethane balloon which is inflated periodically for diastolic augmentation by utilization of helium. The leading end of the device, which is passed into the aorta as a catheter, has a pressure transducer therein.



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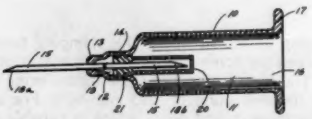
**3,585,984**
**BLOOD TRANSFER DEVICE**
**Robert A. Buchanan, Ann Arbor, Mich., assignor to Parke Davis & Company, Detroit, Mich.**
**Filed Apr. 10, 1968, Ser. No. 720,309**
**Int. Cl. A61m** *1/00*
**U.S. Cl. 128—2** **1 Claim**



A blood transfer device for veni-puncture and the like is provided having a double-pointed cannula, a main chamber for loading and reloading cartridges, and a pilot chamber separated from the main chamber by a resilient collapsible cannula sheath. When the device is used and the cannula is correctly positioned as for veni-puncture, the blood enters the cannula and flows into the pilot chamber through certain aperture means between the cannula and the pilot chamber enabling the operator to confirm visually by the presence of a substantial sample that the placement is correct. One injection serves for the loading and filling of several cartridges, as desired, without spilling of blood between loadings and with minimum risk of exposure to contamination, etc.

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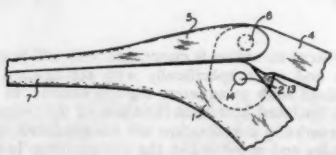
**3,585,985**
**SURGICAL INSTRUMENT FOR BIOPSY**
**Wilbur J. Gould, 115 Central Park West, New York, N.Y.**
**Filed Dec. 16, 1968, Ser. No. 783,899**
**Int. Cl. A61b** *10/00, 17/28, 17/32*
**U.S. Cl. 128—2** **7 Claims**



A surgical instrument comprising a first assembly member having a handle portion, a shank portion and a tip portion all substantially fixed in spatial and structural relation to each other, a second handle member hingedly connected to the first assembly member at the juncture of the handle and shank portions, a shank member hingedly connected to the second handle member and slidably mating with the shank portion of the first assembly member, and a tip member hingedly connected to the shank member at the end thereof remote from the handle-shank hinge and hingedly connected to the first assembly member at the juncture of the tip and shank portions thereof, this tip member being adapted to mate with the tip portion of the first assembly member when the handle member and the handle portion of the first assembly member are moved toward each other.

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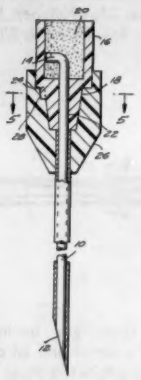
**3,585,986**
**STYLET**
**Albert E. Krug, Wyckoff, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.**
**Filed Aug. 21, 1969, Ser. No. 851,861**
**Int. Cl. A61b** *10/00;* **A61m** *5/32*
**U.S. Cl. 128—2** **4 Claims**



A stylet providing preselected alignment of a hollow outer needle, an inner stylet and a boss and comprising a shaft having an angular portion at one end in predetermined alignment with a bevelled point at the other end, a handle having an inferior hub portion and having a key-slotted central passage communicating with an axially aligned passage in said hub portion, said hub passage adapted to permit the shaft of said needle to be inserted therethrough, said handle passage adapted to nonrotatably retain said angular portion of said needle in said key-slot, and a boss located on the exterior of said hub portion, said boss in predetermined alignment with said key-slot such that the stylet can be aligned with its bevelled end in registry with the bevelled end of the outer hollow needle. The angular portion of the stylet may be positioned in the key slot so as to provide a predetermined shaft length between the hub and the bevelled end thereof, and the angular portion may be bonded in such position.

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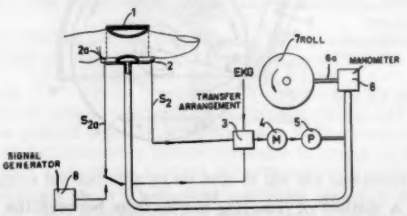
**3,585,987**
**METHOD FOR AUTOMATIC CONTINUOUS MEASURING AND RECORDING OF BLOOD PRESSURE AND ARRANGEMENTS FOR EXECUTING SAID METHOD**
**Arne Bejert Svensson, Hagessten, Sweden, assignor to Aktiebolaget Bofors**
**Filed Aug. 5, 1968, Ser. No. 750,320**
**Claims priority, application Sweden, Aug. 11, 1967, 11413/67**
**Int. Cl. A61b** *5/02*
**U.S. Cl. 128—2.05 Q** **11 Claims**




A method of automatic, continuous measurement and recording of blood pressure, by means of a blood pressure

cuff, in e of a pressure externally applied by means of the cuff automatically is maintained substantially at an intended level. A signal determined by the relationship between the systolic pressure and the cuff pressure actuates the cuff pressure in such a way that when the relationship is altered, this alteration is counteracted by means of a raising or a lowering of the cuff pressure.

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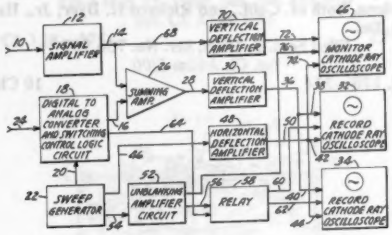
**3,585,988**

## ARRHYTHMIA RECORDING AND CONTROL SYSTEM AND METHOD OF OPERATION

**Walter F. Creigh, Newport; Arney Landy, Jr., Roseville, both of, Minn., and Marvin J. Schmitz, North Hudson, Wis., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.**

**Filed Nov. 20, 1968, Ser. No. 777,353**
**Int. Cl. A61b** *5/04*
**U.S. Cl. 128—2.06** **14 Claims**




An electrocardiographic signal is continuously displayed in a series of consecutive horizontal traces on the face of a cathode-ray tube with each trace being vertically offset from the preceding trace in response to a sequentially stepped reference signal applied with the electrocardiographic signal to the cathode-ray tube vertical deflection amplifier. The cathode-ray tube display is photographed onto one quadrant of a 35 millimeter microfilm.

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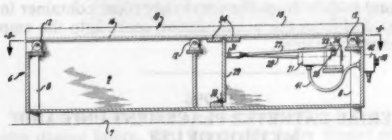
**3,585,989**

## EXERCISE DEVICE

**Harry C. Little, P.O. Box 272, Mt. Shasta, Calif.**

**Filed Sept. 15, 1969, Ser. No. 857,907**
**Int. Cl. A61h** *1/00*
**U.S. Cl. 128—33** **5 Claims**



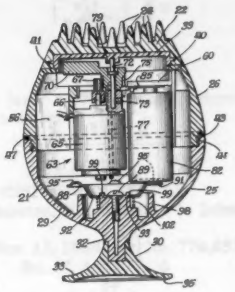
An exercise device comprises a frame on which two side-by-side, horizontal tables are reciprocated 180° out of phase with each other, the tables, considered together, being wide enough and long enough for a person to lie thereon. Reciprocation is accomplished by a timed motor driving a double crank connected by pitmans to rocker arms pivoted on the frame and loosely engaging the tables which are supported on rollers on the frame.

**3,585,990**

## ELECTRIC MASSAGER

**Donald L. Blachly, Glendale; Margaret M. Edwards, Milwaukee, and Willi K. Haeselich, Waukesha, all of, Wis., assignors to John Oster Manufacturing Co., Milwaukee, Wis.**

**Filed Feb. 14, 1969, Ser. No. 800,046**
**Int. Cl. A61h** *1/00*
**U.S. Cl. 128—36** **20 Claims**



An electric massager adapted for use in a wet environment having a housing enclosing an electric motor for rotating an eccentric which vibrates a massaging element on the exterior of the housing. Batteries in the housing supply power to the motor and an inertia switch, which is actuated by striking the housing, controls the energization of the motor.

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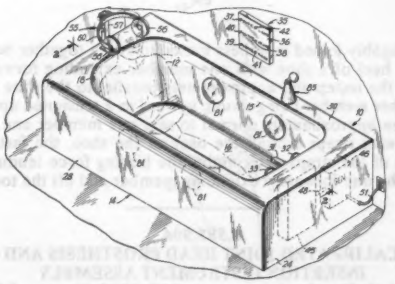
**3,585,991**

## PSYCHOPHYSIOSONIC SYSTEM WITH MULTISENSORY AIDS

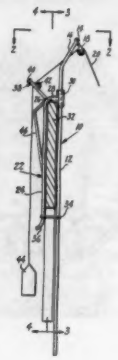
**Lewis Balamuth, New York, N.Y., assignor to Ultrasonic Systems, Inc., Farmingdale, N.Y.**

**Continuation-in-part of application Ser. No. 666,871, Sept. 11, 1967, now Patent No. 3,499,437, dated Mar. 10, 1970, which is a continuation-in-part of application Ser. No. 622,126, Mar. 10, 1967, now Patent No. 3,499,437, dated Mar. 10, 1970. This application Nov. 14, 1969, Ser. No. 876,895**
**Int. Cl. A61h** *9/00*
**U.S. Cl. 128—66** **46 Claims**



The simultaneous application of a number of stimuli to humans for therapeutic purposes involving audible and inaudible sound vibrations introduced into the interior of human beings by means of underwater projection, in combination with sensory stimulation.

**3,585,992**
**TRACTION APPARATUS**
**Elmer L. Vessels, 8021 Stevenson Ave., Sacramento, Calif.**
**Filed Oct. 8, 1968, Ser. No. 765,906**
**Int. Cl. A61h** *1/02*
**U.S. Cl. 128—75** **8 Claims**



Inner and outer frame members are arranged on opposite sides of a headboard of a bed and connected at the top to rest on the top edge of the headboard, the frame members being provided with pulleys over which passes a nylon or other flexible member, one end of which is connected to a patient on a bed and the other end of which carries a weight to transmit traction to the patient in the bed.

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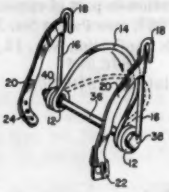
**3,585,993**
**TOE LIFT DEVICE FOR A DROPPED FOOT**
**Aljie Heedly, New Orleans, La., assignor to James B. Lake, Jr., New Orleans, La., a part interest**
**Filed July 22, 1969, Ser. No. 843,353**
**Int. Cl. A61f** *3/00*
**U.S. Cl. 128—80** **4 Claims**



Swingably joined members biased to swing together bolted to the heel of a shoe with one member extending forwardly under the instep and approximately parallel to the shoe sole, the other member being swung upward in a tensioned upright position approximately normal to said one member and held there with straps around the back of the shoe, the fastened length of the straps determining the biasing force tending to raise the one forwardly extending member and lift the toe.

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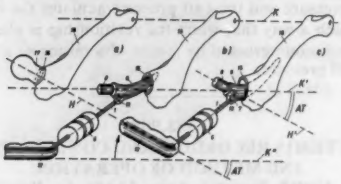
**3,585,994**
**CALIBRATED JOINT HEAD PROSTHESIS AND INSERTION INSTRUMENT ASSEMBLY**
**Arnold H. Huggler, Masanserstr 168, 7000 Chur, and Bernhard G. Weber, St. Gallen, both of, Switzerland**
**Filed Apr. 21, 1969, Ser. No. 817,720**
**Claims priority, application Switzerland, Apr. 25, 1968, 6198/68**
**Int. Cl. A61b** *17/18;* **A61f** *5/04*
**U.S. Cl. 128—83** **2 Claims**

The instrument has a straight line shaft which is provided with a calibrated cylindrical hook at one end and a pistol grip at the opposite end. The hook is sized to engage in an eye on a shaft of a prosthesis with a snug fit and is set perpendicularly to the instrument shaft. A hammering element is also slidably mounted on the instrument shaft to impact against an anvil on the hook.



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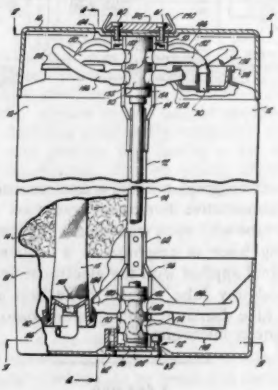
**3,585,995**
**AUTOTRANSFUSION APPARATUS**
**George D. Perkins, South Pasadena; David E. Workman, Pasadena, both of, Calif., and Richard H. Dyer, Jr., Havertown, Del.**
**Filed Sept. 3, 1968, Ser. No. 756,907**
**Int. Cl. A61m** *5/00*
**U.S. Cl. 128—214** **10 Claims**



Blood autotransfusion apparatus is described which employs the use of a dual container arrangement for reinfusing blood which is normally lost during surgery into a living mammal such as a human patient. The arrangement includes a dual valve control system for controlling blood flow from an accumulation space, i.e. an abdominal cavity, into one container and from a previously filled container back into the patient. Thereafter switching of the dual valve control system causes blood to flow from the previously filled container into the patient and from the accumulation space into the empty or near empty container.

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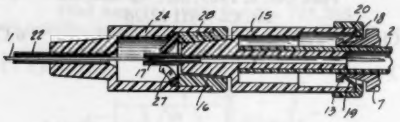
**3,585,996**
**ARTERIAL CATHETER PLACEMENT UNIT AND METHOD OF USE**
**Gordon S. Reynolds, and Karl A. Pannier, Jr., both of Salt Lake City, Utah, assignors to Levoy's Corporation, Salt Lake City, Utah**
**Filed July 11, 1968, Ser. No. 744,089**
**Int. Cl. A61m** *5/00*
**U.S. Cl. 128—214.4** **5 Claims**

A catheter placement unit for positioning a catheter in a body lumen, such as an artery or vein, for purposes of parenteral infusion, or pressure monitoring, oximetery, or other diagnostic purposes, and a method of utilizing such catheter placement unit. The unit or assembly includes a hollow needle, a hub on the needle and a self-sealing valve in

the needle hub; a sheath, a catheter in the sheath, and a hub carrying a hollow pilot projection, removably connected to the sheath. The needle may, if desired, be initially used



separately and then the sheath and catheter connected to the needle by joining the hubs with the pilot projection extending through the valve to permit advancing the catheter through the needle into a body lumen.

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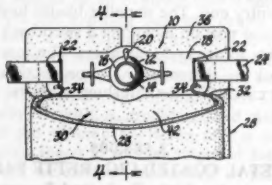
**3,585,997**
**TRACHEOSTOMY DEVICE**
**Sigmund H. Ancerewicz, Jr., 12242 Elmdale, Detroit, Mich.**
**Filed May 15, 1969, Ser. No. 824,916**
**Int. Cl. A61f** *5/44*
**U.S. Cl. 128—275** **12 Claims**



A tracheostomy device comprising a receptacle that can be mounted adjacent to a tracheal opening for easy manipulation between a normal position to collect drainage from the tracheal opening and a tilted position to intercept any material forcibly expelled from the tracheal opening due to coughing, without at the same time providing any obstruction to breathing through the tracheal opening.

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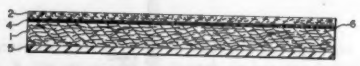
**3,585,998**
**DISPOSABLE DIAPER WITH RUPTURABLE CAPSULES**
**Donald E. Hayford, Centerville, Ohio, and Georg Horger, Steppach, Germany, assignors to The National Cash Register Company, Dayton, Ohio**
**Filed Mar. 29, 1968, Ser. No. 717,258**
**Int. Cl. A61f** *13/16*
**U.S. Cl. 128—284** **2 Claims**



This invention is directed to disposable baby diapers and baby diaper liners, viz., disposable baby diaper components containing encapsulated baby oil.

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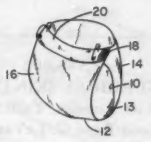
**3,585,999**
**DIAPERS WITH WAISTBAND REINFORCEMENTS SERVING AS AFTER-USE FACE WRAPS**
**Joseph S. Wanberg, Wilmette, Ill., assignor to The Kendall Company, Boston, Mass.**
**Filed June 20, 1969, Ser. No. 835,027**
**Int. Cl. A61f** *13/16*
**U.S. Cl. 128—287** **10 Claims**

Disposable diapers are provided with an attached after-use front covering which before and during use lies in one or more pieces on the back side of the diaper but is hingeable around the diaper and may, as it lies on the back side, function as a multiple layer waistband reinforcement providing improved pin tear resistance.



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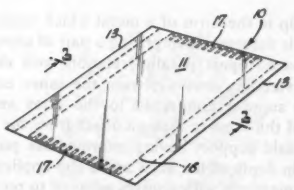
**3,586,000**
**DISPOSABLE DIAPER**
**Irving S. Ness, Princeton, N.J., assignor to Johnson & Johnson**
**Filed Nov. 15, 1968, Ser. No. 776,055**
**Int. Cl. A61f** *13/16*
**U.S. Cl. 128—287** **2 Claims**



A substantially rectangular disposable diaper having a waterproof backing sheet and an absorbent permeable facing sheet with the backing and facing sheets being substantially coextensive. The backing and facing sheets are adhered or secured together along their longitudinal edges. Between the sheets is a layer of fluffy absorbent material encased in tissue and extending the full length of the sheets but only partially across the width of said sheets.

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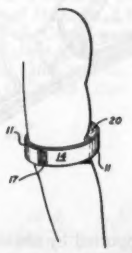
**3,586,001**
**MEDICAL COMPRESS**
**Dewey S. C. Sanderson, 4890 Troy, Denver, Colo.**
**Filed Nov. 22, 1968, Ser. No. 778,118**
**Int. Cl. A61b** *17/12*
**U.S. Cl. 128—327** **1 Claim**



A medical compress for staunching flow of blood from a wound or a vein after withdrawal of a needle employed to draw blood or for introducing medicine or plasma into the circulation, comprising a band adapted to encircle a human limb, said band having nonelastic end members and an elastic portion between the ends, and a cushion attached to the elastic portion. The attaching means between the cushion and elastic portion of the band is limited to the central area of one face of the cushion, leaving the major portion of the

cushion free for self-adjustment to the limb of the wearer. The elastic portion of the band is limited in length approximately to the area overlying the cushion whereby pressure is concentrated on the cushion, and constriction of blood vessels is avoided.

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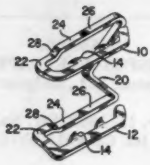
**3,586,002**

## SURGICAL SKIN CLIP

**Ernest C. Wood, Los Angeles, Calif., assignor to Peter B. Samuels, Encino and Rene G. LeVaux, Los Angeles, Calif., part interest to each**

**Filed Jan. 8, 1968, Ser. No. 696,466**
**Int. Cl. A61b *17/08***
**U.S. Cl. 128—337** **10 Claims**




A skin clip in the form of a metal which retains the shape to which it is deformed comprising a pair of elongate arms in laterally spaced apart parallel relation with skin engaging members extending inwardly from the inner edges of each arm and a support connected to the arms and extending crosswise of the arms in a plane offset from the plane of the arms with said support having intermediate portions which limit the clip depth of the arms and a clip applicator having a pair of jaw members with grooves adapted to receive the supporting portions therebetween and means constantly urging the jaw members in a direction towards each other with a force sufficient to retain the clips therebetween when in open position and in which the clip arms may have a number of longitudinally spaced skin gripping members for lengthwise suturing of the skin.

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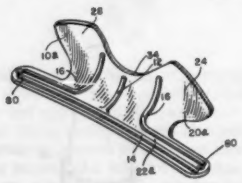
**3,586,003**

## MEANS FOR SUPPORTING A FLAT FOOT

**Walter C. Baker, Wichita, Kans., assignor to Duane C. Bowen, Wichita, Kans., a part interest**

**Filed Apr. 28, 1969, Ser. No. 819,726**
**Int. Cl. A43b *7/14***
**U.S. Cl. 128—586** **8 Claims**



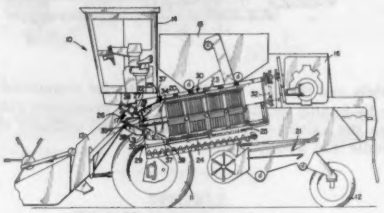

A flat foot is supported by abutment on the inside of the foot to the first cuneiform bone and to the heel bone by a structure built into a shoe or inserted into a standard shoe including a first flange abutting the inside of the foot and a second horizontal flange underlying the foot arch and supporting the first flange in upright position, the first flange having a first forward portion abutting a portion of the first cuneiform bone and a second rear portion abutting a portion of the heel bone, the upper edge of the first flange intermediate the first and second portions being immediately below the level of the navicular bone.

**3,586,004**

## ROTOR KNIFE ATTACHMENT

**Richard A. De Pauw, East Moline, Ill., and William H. Knapp, Davenport, Iowa, assignors to International Harvester Company, Chicago, Ill.**

**Filed Oct. 8, 1969, Ser. No. 864,848**
**Int. Cl. A01f *12/20***
**U.S. Cl. 130—27 T** **6 Claims**



A threshing machine having an elongated threshing cylinder through which crops are axially fed. A rotor mounted within the threshing cylinder having impeller blades at the grain entry end. The impeller blades have a flat planar portion, a scoop portion including a sweptback leading edge, and detachable rotary knife members. The rotary knife members can work by themself or in conjunction with the stationary knife carried by the threshing cylinder.

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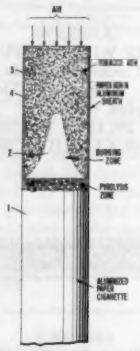
**3,586,005**

## METAL COATED CIGARETTE PAPER

**Alfred Lippman, Jr., Little Rock, and Bernard Flynn Armbrust, Jr., Benton, both of, Ark., assignors to Reynolds Metals Company, Richmond, Va.**

**Continuation-in-part of application Ser. No. 609,384, Jan. 16, 1967, now abandoned. This application Oct. 14, 1968, Ser. No. 767,444**
**Int. Cl. A24d *01/02*; D21h *05/16***
**U.S. Cl. 131—15** **15 Claims**



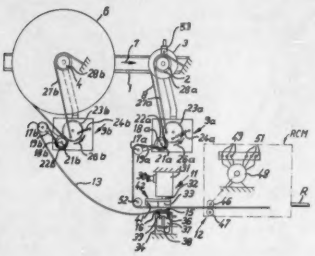

A cigarette wrapper having a coating of metal which does not significantly reduce porosity and combustibility of the wrapper but does significantly increase peak burning temperature of the cigarette using the wrapper (the coating weight being preferably about 1 microgram per square millimeter for optimum reduction of biological activity of the smoke from a cigarette using the wrapper). The metals which have been found suitable are the aluminous metals, iron and tin.

3,586,006

## METHOD AND APPARATUS FOR SPLICING WEBS OF CIGARETTE PAPER OR THE LIKE

Gerd-Joachim Wendt, Hamburg-Bergedorf, Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg-Bergedorf, Germany

Filed Aug. 26, 1968, Ser. No. 755,255
Claims priority, application Germany, Aug. 31, 1967, H63760
Int. Cl. B65h *19/16*
U.S. Cl. 131—31 8 Claims



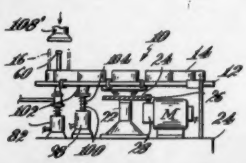
The leading end of a fresh web which is stored on a reel is automatically spliced to an expiring web when the machine which consumes the expiring web and draws such expiring web from a source of supply is arrested in response to a signal from a detector which scans the supply of expiring web and produces the signal when the supply of expiring web is depleted to a predetermined minimum value. The consuming machine is started with a predetermined delay following completion of the splicing operation and is accelerated to normal operating speed in several stages at such a rate that the united webs which are accelerated in response to acceleration of the consuming machine are not subjected to excessive tensile stresses.

3,586,007

## CIGARETTE SMOKING MACHINE

Thomas F. Kelley, Canton, and Colin A. Morrissey, Cambridge, both of, Mass., assignors to Bio-Research Consultants, Inc., Cambridge, Mass.

Filed Aug. 21, 1967, Ser. No. 661,937
Int. Cl. A24f *13/00, 47/00*
U.S. Cl. 131—171 6 Claims



An apparatus comprising a holder for one or more cigarettes, a low pressure condenser and a conductor connecting the holder to the condenser whereby large scale collection of the condensable components of the smoke from one or more cigarettes may be obtained for the purpose of analysis to determine the amount of such components inhaled by a cigarette smoker.

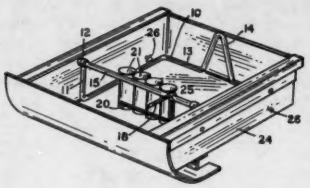
3,586,008

## CIGARETTE SNUFFERS FOR ASH TRAYS

Edouard J. Fredette, St. Boniface, Manitoba, Canada, assignor to Roland J. Bertrand, St. Boniface, Manitoba, Canada, a part interest

Filed Dec. 4, 1969, Ser. No. 882,109
Int. Cl. A24f *19/14*
U.S. Cl. 131—235 2 Claims

A framework for removable frictional entry into an ashtray; said framework rotatably supporting a container or containers for receiving and snuffing out cigarettes, when the lighted end of same are dropped therein; and a handle or lever is provided for manual finger turning of said containers to gravity transfer the cigarettes into the ashtray.



3,586,009

## HAIR FROSTING CAP

Brink J. Sirmons, 312 West Lebanon St., Mount Airy, N.C.

Filed Dec. 10, 1969, Ser. No. 883,879
Int. Cl. A45d *19/00*
U.S. Cl. 132—9 10 Claims

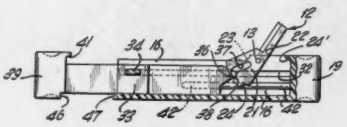
A frosting cap consisting of a foundation disc and the plurality of endless sectional bands of various sizes are maintained in abutting relationship by tab members to form a hollow body which conforms substantially to the head of a wearer. Strands of hair selected for bleaching extend between abutting bands as the bands are placed sequentially over the head of a wearer.

3,586,010

## COMPACT CONSTRUCTION

William James Landen, Cheshire; John W. Pfrommer, Cheshire; James Michael McArdle, Cheshire, and Richard A. Mason, Orange, all of, Conn., assignors to Eyelet Specialty Company, Wallingford, Conn.

Filed Nov. 25, 1968, Ser. No. 778,667
Int. Cl. A45d *33/00*
U.S. Cl. 132—83 27 Claims



The invention contemplates a basic container structure in which a closure lid is caused to unlock and popup, in response to relative movement between a drawer and a frame; the container comprises essentially these three parts. The interconnection between moving parts is such that positive control is retained over lid positioning, and there is no

rattling or play between parts. In the closed position of the lid, positive locking is achieved at widely spaced locations, assuring a clamped peripheral seal against loss of cosmetic or the like contents (e.g., powder) when not in use. Customizing effects for particular customers' unique appearance requirements are achieved by incorporation of a separate head for the drawer, through locking engagement to the basic construction; mold costs may thus be shared by a large number of customers, all except for the variations involved in particular head designs.

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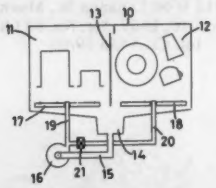
**3,586,011**
**DISH WASHER**
**Lamberto Mazza, Pordenone, Italy, assignor to Industrie A. Zanussi S.p.A., Pordenone, Italy**
**Filed Aug. 4, 1969, Ser. No. 847,166**
**Int. Cl. B08b** *3/02*
**U.S. Cl. 134—57** **6 Claims**




The washing chamber of a dishwashing machine is divided in two zones, one for dishes, glasses and the like, the other for metallic saucepans and the like; the jets of solution in both zones are fed from the same source, and the jets in the first zone are closed automatically when the temperature of the solution reaches a certain degree, so that the solution is successively sprayed at a higher temperature and higher pressure only on the metallic saucepans.

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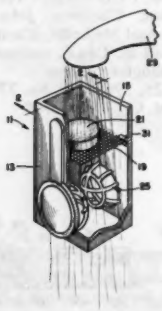
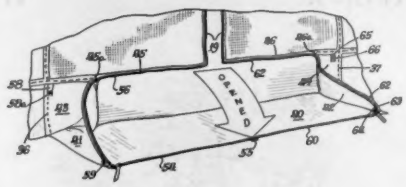
**3,586,012**
**MANUAL CONTACT LENS CLEANING DEVICE**
**Edward A. Paule, Fort Worth, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.**
**Filed Mar. 12, 1969, Ser. No. 806,510**
**Int. Cl. B08b** *3/04*, *11/02*
**U.S. Cl. 134—93** **9 Claims**



A contact lens cleaning unit including means defining a fluid passageway, a support means for a dissolvable lens treating composition in the fluid passageway and a lens receiving basket in the path of fluid containing the dissolved treating composition. The cleaning unit is adapted for holding under a running water tap to provide for cleaning of contact lenses.

**3,586,013**
**TENT WITH DROP CLOTH THRESHOLD CONSTRUCTION**
**David J. Gladden, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.**
**Filed June 30, 1969, Ser. No. 838,378**
**Int. Cl. A45f** *1/00*, *1/08*
**U.S. Cl. 135—1** **6 Claims**



The doorway of a tent is provided with openable door panels having a lower horizontal edge terminating above ground level. Beneath the door panels is a threshold assembly including a drop cloth which may be selectively secured in a raised position or released to a lowered position in which the drop cloth lies flat on the ground to facilitate sweeping out debris within the tent. In the raised position, the drop cloth is secured by a slide fastener to the lower edges of the door panels to form part of the closure of the doorway. Two embodiments are disclosed; one has a waterproof base.

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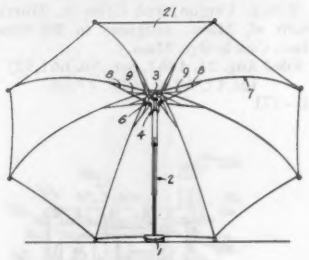
**3,586,014**
**LONGITUDINALLY SHORTENABLE UMBRELLA**
**Heinz Weber, Rhineland, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada**
**Filed Nov. 10, 1969, Ser. No. 875,159**
**Claims priority, application Germany, Nov. 9, 1968, P 18 08 002.9**
**Int. Cl. A45b** *19/08*
**U.S. Cl. 135—25 R** **3 Claims**




A trip lever associated with the auxiliary runner of the umbrella and adapted to engage an opening in the umbrella stick momentarily retarding the advance of the auxiliary runner as the main runner is being pressed forward when opening the umbrella.

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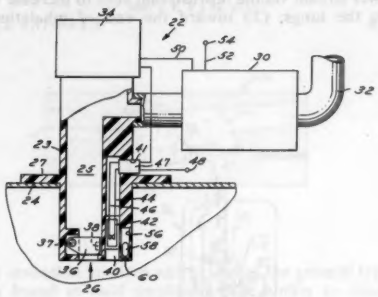
**3,586,015**
**FUEL TANK VAPOR SEPARATOR SYSTEM HAVING MAGNETIC ATTITUDE SENSING MEANS**
**Ernest W. Kitzner, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.**
**Filed Jan. 22, 1970, Ser. No. 5,081**
**Int. Cl. F16k** *31/02*
**U.S. Cl. 137—39** **6 Claims**

A magnetically actuated electric switch responsive to a liquid fuel sensing device and a switch responsive to a pressure device are connected in series with each other and with a solenoid valve controlling fluid flow through a conduit connected to the upper interior of the fuel tank. The solenoid valve opens only when tank pressure exceeds a predeter-

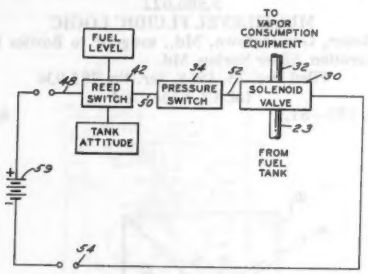
mined minimum and the conduit opening is free of liquid fuel. A magnet that moves in response to fuel tank attitude acts on the magnetically actuated switch to prevent the valve from opening whenever tank attitude varies from normal tank attitude by some predetermined amount.



## 3,586,016
## FUEL TANK LIQUID VAPOR SEPARATOR SYSTEM HAVING ATTITUDE SENSING MEANS

David O. Meyn, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 22, 1970, Ser. No. 5,082
Int. Cl. F16k *31/02*
U.S. Cl. 137—39 5 Claims



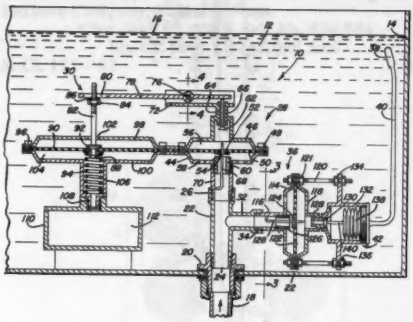

Electrical switches actuated by a liquid fuel sensing device and by a pressure device are connected in series with each other and with a solenoid valve controlling fluid flow through a conduit connected to the upper interior of the fuel tank. The solenoid valve opens only when tank pressure exceeds a predetermined minimum and the conduit opening is free of liquid fuel. A fuel tank attitude sensing mechanism prevents the valve from opening whenever tank attitude varies from normal tank attitude by some predetermined amount.

## 3,586,017
## ANTIFREEZING LIQUID LEVEL REGULATING CONTROL

William R. Walters, 1300 Sunset, Pawhuska, Okla.

Filed Dec. 16, 1968, Ser. No. 784,002
Int. Cl. F16k *21/18*; E03b *7/12*
U.S. Cl. 137—59 7 Claims

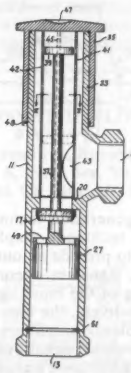
A water level controlling apparatus submerged within a water receptacle for conducting water under pressure into the receptacle in order to maintain a predetermined level of water therein. A limited amount of additional water is admitted to the receptacle under control of a temperature sensor in order to prevent freezing of the water.



## 3,586,018
## SELF-CLOSING VALVE

Sven-Eric Bogardh, and Sven V. Nordquist, both of Angelholm, Sweden, assignors to Aktiebolaget Thermia-Verken, Arvika, Sweden

Filed Feb. 24, 1969, Ser. No. 801,603
Int. Cl. F16k *31/00*
U.S. Cl. 137—67 7 Claims



A self-closing valve is disclosed wherein the valve body is temporarily prevented from closing by an obstacle that is slowly removed by the fluid flowing through the valve. Said obstacle may consist of a dissolvable plug that is placed in a chamber into which an extension of the valve body reaches so as to rest against said plug. Said chamber has an easily removable cap enabling convenient replacement of such plugs. The dissolvable substance may also consist of a powder filling in a perforated sleeve. The liquid flow past the dissolvable substance may be changed in order to vary the retardment of the closure of the valve.

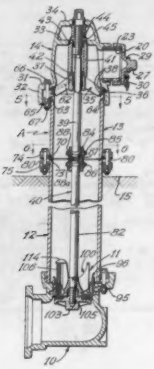
## 3,586,019
## FIRE HYDRANT

David F. Thomas, St. Paul, and Harold A. Berglund, Afton, both of, Minn., assignors to Waterous Company, Ramsey, Minn.

Filed Dec. 18, 1968, Ser. No. 784,827
Int. Cl. F16l *57/00*; E03b *9/14*; F16d *1/00*
U.S. Cl. 137—68 10 Claims

The hydrant is made so that if the exposed portion is struck by a moving vehicle or the like this portion will break

off with a minimum of damage to the hydrant and vehicle.



The operating mechanism provides high strength for wrenching, and protection from corrosion.

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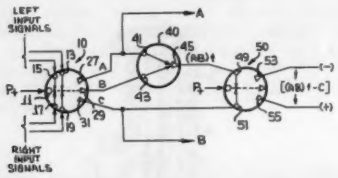
**3,586,020**
**ADAPTIVE FLUIDIC FUNCTION GENERATORS**
**Romald E. Bowles, Silver Spring, Md., assignor to Bowles Fluidics Corporation, Silver Spring, Md.**
**Filed June 20, 1968, Ser. No. 738,540**
**Int. Cl. F15c *1/12***
**U.S. Cl. 137—81.5** **59 Claims**




Variable function generation techniques are disclosed for fluidic systems. One technique employs a fluidic amplifier which is constructed to provide an output signal as a variable function of an input signal in accordance with selectively variable proportioning of the input signal among the amplifier input ports. Alternatively, the input signal is variably proportioned between plural amplifiers having different gain characteristics, the output signals of each amplifier being combined to provide a common signal. A still further alternative comprises amplification of a differential pressure signal in a proportional three-output passage fluidic amplifier, the three output signals from the amplifier being selectively paired to provide various functions of the input signal, the various functions in turn being selectively gated to provide an output signal comprising various combinations of the functions.

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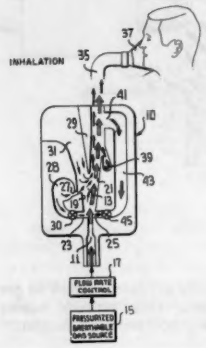
**3,586,021**
**FLUIDIC BREATHING ASSISTOR**
**James P. McGuinness, Hyattsville, Md., assignor to Bowles Fluidics Corporation, Silver Spring, Md.**
**Filed Nov. 26, 1968, Ser. No. 778,926**
**Int. Cl. F15c *1/04***
**U.S. Cl. 137—81.5** **16 Claims**

A fluidic breathing assistor comprises a bistable fluidic amplifier of the wall-attachment type which selectively supplies a power stream of breathable gas to a patient's lungs via an outlet channel, or dumps the power stream into an exhaust channel along with exhaled air entrained by the power stream from the outlet channel. Means are provided to switch the power stream from the outlet channel to the exhaust channel when the lungs are inflated to a predetermined adjustable pressure, the power stream remaining so switched until the patient begins to inhale. A downstream vent passage communicating between ambient air and the outlet channel serves four functions during four respective operating modes: (1) during inhalation, substantial ambient air is entrained by the power stream via the downstream vent to increase the air flow to the lungs; (2) toward the end of inhalation, the downstream vent begins to bleed power stream gas providing a gradual, rather than sudden decrease of flow to the lungs; (3) during exhalation, the downstream vent bleeds substantial exhaled air from the outlet channel to minimize resistance to exhalation; and (4) after exhalation sufficient ambient air is provided to the outlet channel via the downstream vent to prevent further evacuation of the lung by the exhausting power stream.

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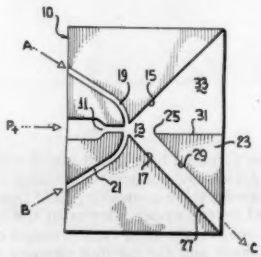
**3,586,022**
**MULTILEVEL FLUIDIC LOGIC**
**Peter Bauer, Germantown, Md., assignor to Bowles Fluidics Corporation, Silver Spring, Md.**
**Filed Dec. 23, 1968, Ser. No. 785,936**
**Int. Cl. F15c *1/04***
**U.S. Cl. 137—81.5** **8 Claims**

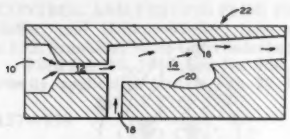



Three distinct pressure levels, corresponding to three respective digital signal levels, are selectively provided at an output passage of a fluidic element in accordance with input logic conditions. The fluidic element has a power stream which can be switched to three distinct positions; in one position the power stream aspirates fluid from the output passage providing a negative output pressure level thereat; in a second position the power stream is received by the output passage providing a positive pressure thereat; in the third power stream position the output passage is unaffected by the power stream and thus provides a zero pressure.

## 3,586,023
## FLUIDIC THROTTLE

Theodore J. Fussell, Bound Brook, N.J., assignor to American Standard Inc., New York, N.Y.

Filed Mar. 13, 1969, Ser. No. 807,634
Int. Cl. F15c 4/00
U.S. Cl. 137—81.5 9 Claims

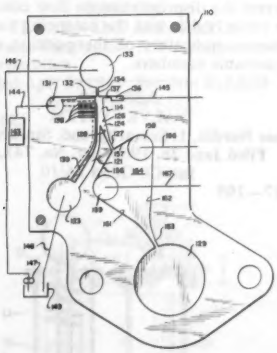



The invention involves a structure of the general type commonly found in fluid amplifiers. The ability to change the direction of flow of a fluid stream is employed to cause the fluid to undergo a change from flow through a primary discharge leg at essentially full line pressure to a flow through the same leg at a very substantially reduced pressure. The pressure drop can be used, by way of example, as a means of activating or deactivating a valve as well as a means of attenuating water hammer, a means for conserving fluid in a continuous flow system by decreasing flow rate in accordance with the needs of the system and as an amplifier by converting a weak signal at the control port into a signal of greater magnitude at the discharge port.

## 3,586,024
## HIGH GAIN MONOSTABLE FLUIDIC SWITCHING DEVICE

John J. Tuzson, Evanston; James R. Vaughn, Des Plaines, and Cecil D. Oglesby, Elk Groove Village, all of, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed June 25, 1969, Ser. No. 836,369
Int. Cl. F15c 1/10
U.S. Cl. 137—81.5 8 Claims

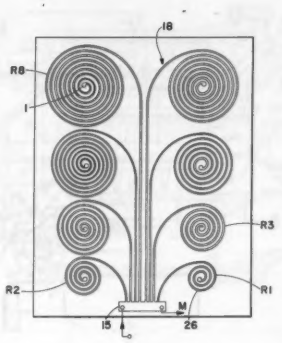



A high gain monostable fluid amplifier serves as a metering valve in which a fluid stream can be deflected from a primary receiver to an alternate receiver by means of control pulses. The frequency and duration of the control pulses provide means for varying the amount of fluid delivered to the alternate receiver. Auxiliary control slots employed in the interaction region provide rapid response to the presence and absence of a control pulse and provide sharp cutoff when switching from the auxiliary receiver to the primary receiver. The control slots are arranged to oppose wall attachment in the primary receiver when a control pulse is present and to assist wall attachment in the primary receiver in the absence of a control pulse. In the preferred form, the metered fluid is liquid and the control fluid is gas, for example, a liquid fuel metered by an air signal.

## 3,586,025
## FLUID SYSTEM RESISTANCE TEMPERATURE COMPENSATION

Paul M. Blaiklock, Newton Center, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed June 19, 1969, Ser. No. 834,846
Int. Cl. F15c 3/14; G06d 3/00
U.S. Cl. 137—82 1 Claim

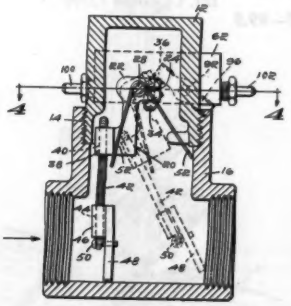



Temperature compensation for fluid systems having fluid restrictors therein. Each restrictor is established as a laminar flow element. The result is an essentially constant flow ratio as between restrictors with temperature change. As an example, a digital to analog converter system is shown.

## 3,586,026
## APPARATUS RESPONSIVE TO FLOW OF FLUID WITH VALVE

Harold J. Olson, 634 Broadway, Raynham, Mass.

Filed May 5, 1969, Ser. No. 821,671
Int. Cl. F16r 31/12
U.S. Cl. 137—87 6 Claims



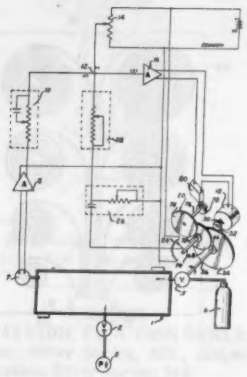

Apparatus that is operable by flow of fluid to control the speed of a motor during a pumping operation. A flap actuated by said fluid flow is operably connected to rotate a shaft, which opens a vacuum passage in a casing that communicates with the vacuum in an automobile motor to actuate a throttle whereby motor speed is controlled automatically. A valve mounted in said casing controls the degree of vacuum in said passage.

3,586,027

## AUTOMATIC PRESSURE CONTROLLER

John J. Fitzgerald, Jr., 1329 Crampton, Dallas, Tex., and Waylon C. Penland, Lewisville, Tex.

Filed Apr. 1, 1968, Ser. No. 717,863
Int. Cl. F16k *31/02*; G05d *16/20*
U.S. Cl. 137—87 11 Claims



An automatic pressure controller which controls the pressure in a vacuum chamber by regulating the flow of gas into or out of the chamber with a valve controlled by a double loop servosystem in which a position feedback signal from the valve prevents the valve from being moved past the equilibrium position to reduce "hunting."

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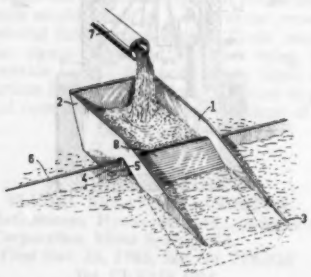
3,586,028

## APPARATUS FOR METERING A QUANTITY OF ADDITIVE SUBSTANCE WITH RESPECT TO A MAIN SUBSTANCE IN RESPONSE TO THE QUANTITY OF THE LATTER SUBSTANCE

Sixten Englesson, Djursholm, Sweden, assignor to Stenberg-Flygt AB, Solna, Sweden

Filed Dec. 3, 1968, Ser. No. 780,727
Int. Cl. G05d *11/00*
U.S. Cl. 137—99.5 3 Claims



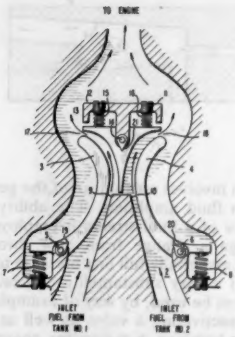
A method for metering a certain quantity of addition substance to a main substance by means of two vessels of different size - one for the main substance and the other for the addition substance - which are filled batchwise and which are both emptied into a mixing vessel as soon as the larger vessel is filled (the smaller under actuation of the larger) and which are then returned to starting position, to be refilled.

3,586,029

## APPARATUS FOR AUTOMATICALLY CONTROLLING FLUID FLOW ACCORDING TO PREDETERMINED VOLUMETRIC PROPORTIONS

James D. Evers, Corry, Pa., assignor to Aero-Flow Dynamics, Inc., Corry, Pa.

Filed June 16, 1969, Ser. No. 833,258
Int. Cl. G05d *11/03*
U.S. Cl. 137—100 10 Claims




A device for automatically controlling the volumetric fluid flow from two separate sources according to a predetermined ratio, including two conduits leading from the respective sources and extending in generally convergent paths, a balancing vane device disposed at the juncture of the two conduits such that each side of the vane serves as an extension of the surface of a respective conduit, and a flapper valve body associated with each of the two conduits in the region of the balancing vane device, each of the flapper valve bodies being spring-biased in a direction restricting fluid flow through the associated conduit and thus serving as a nozzle, the balancing vane device being supported for rotation about a central pivot, but being spring-biased to remain in an equilibrium position. Each of the contoured sides of the balancing vane includes a portion adapted to cooperate with a respective flapper valve body in the event of a disproportionate fluid flow tending to cause rotation of the balancing vane to correct the disproportionate flow conditions. Both of the flapper valve bodies and the balancing vane may further include external indicators of the position of each of the respective movable members.

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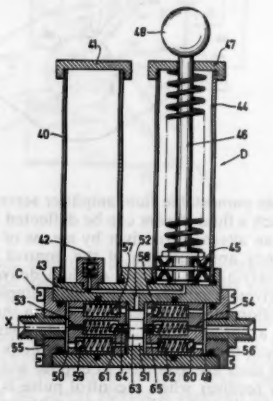
3,586,030

## VALVE SYSTEM

Lars-Gunnar Nordin, 1, Samaritgrand, Stockholm, Sweden

Filed June 28, 1968, Ser. No. 741,185
Int. Cl. G05d *16/10*
U.S. Cl. 137—109 3 Claims



A valve system disposed between two pressure systems employing the same pressure medium, which includes valves

responsive to a decrease in pressure in either pressure system to enable pressure to be restored therein, valves responsive to excessive pressure in either of said pressure systems to relieve said excess pressure and means cooperating with additional valves when there is excessive pressure in both pressure systems to balance the pressures therein.

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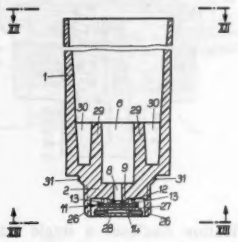
3,586,031

## FLOW-CONTROL AND TESTING PLUG FOR PIPELINES

Franz Muller, and Helmut Muller, both of Konigsteiner Strasse 132, Frankfurt/Main-Unterliederbach, Germany

Filed Feb. 18, 1969, Ser. No. 800,228
Claims priority, application Austria, Feb. 20, 1968, A1611/68
Int. Cl. F16k *45/02*
U.S. Cl. 137—199 7 Claims



A flow control and testing plug adapted to be applied to a pipeline or the like for the purpose of pressure testing the same. The plug has a valving mechanism for preventing entrance of dirt or foreign matter and for controlling inflow and outflow of air into and out of the pipeline, such mechanism being operable either manually or automatically. The automatic operation of the valving mechanism is preferably effected by liquid which is pumped into the pipeline at another location and which expels the air therefrom through the valved plug.

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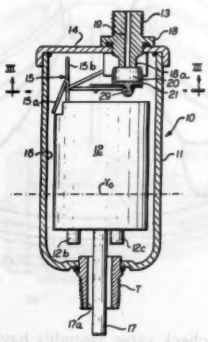
3,586,032

## FLOAT VENT APPARATUS

Richard Weinstein, Huntington, N.Y., assignor to Flair Manufacturing Corporation

Filed Apr. 3, 1969, Ser. No. 813,050
Int. Cl. F16k *45/02*
U.S. Cl. 137—202 5 Claims



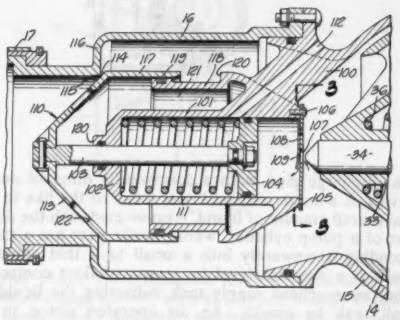
An improved venting device used for removing air and other gases from closed liquid systems, and particularly to a venting apparatus having a gas vent valve which is automatically operated by a float controlled junction member arrangement.

3,586,033

## COMBINED AERIAL REFUELING COUPLING AND PRESSURE REGULATOR

Ellsworth E. Hieber, Glendale, Calif., assignor to Schulz Tool and Manufacturing Co., San Gabriel, Calif.

Filed July 7, 1969, Ser. No. 839,203
Int. Cl. G05d *16/10*
U.S. Cl. 137—220 1 Claim



A probe nozzle and drogue fuel line coupling for in-flight refueling of aircraft, and in which a balanced poppet valve automatically regulates the flow of the transferred fluid and prevents pressure surges in response to variations of the pressure of the transferred fluid from a predetermined value.

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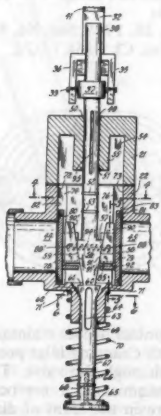
3,586,034

## AUTOMATIC DRAINING AND LOCKING FLUID VALVE

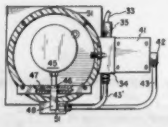
Michael P. Karzeniowski, 75 Mapel St., Yonkers, N.Y.

Continuation-in-part of application Ser. No. 708,025, Feb. 26, 1968, now Patent No. 3,511,274. This application Jan. 29, 1970, Ser. No. 6,689
Int. Cl. E16k *23/00, 5/14*
U.S. Cl. 137—312 9 Claims



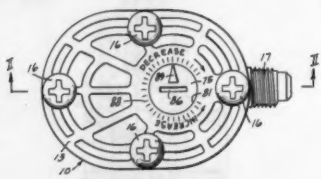
A fluid disc valve wherein the sealing movable discs, during operation are directed in a perpendicular movement toward and away from the fixed element surface against which they seal. When in the closed position, the lower portion of the valve body is open and the upper portion vented so as to permit rapid drainage therefrom of any liquids accumulating therein. This lower opening automatically seals when the valve is open. The bottom surface of the valve body is contoured to direct the liquid therein to be discharged through a lengthwise slot provided in the valve stem which when in its lowest stage positions a portion of the slot exterior of the valve body.

3,586,035
MEASURED LIQUID DISPENSER
Russell G. Rutherford, 8045 Beach Drive, Rockford, Ill.
Division of Ser. No. 552,803, Mar. 25, 1966, Pat. No. 3,431,953.
Filed Feb. 3, 1969, Ser. No. 805,391
Int. Cl. F16k 31/24, 31/38
U.S. Cl. 137—417 3 Claims



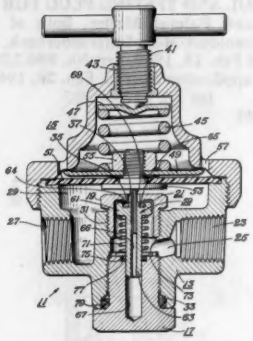
A discharge pipe, with a downwardly directed outer end serving as a nozzle disposed over a can or the like to receive a measured amount of liquid, is connected with the discharge port of a pump cylinder, whose intake port has a standpipe extending downwardly into a small tank that contains the liquid at a constant level by reason of float control, there being an overhead supply tank delivering the liquid to the small tank by gravity. An air operated piston in an air cylinder behind the pump cylinder operates the piston of the pump cylinder once per can as a spring-pressed arm that controls an air valve for the air cylinder is swung in one direction by a can fed past it and the arm thereafter returns to normal position under spring pressure. The rate of discharge of liquid from the pipe is regulated by a manually adjustable valve to avoid splatter, this being possible by virtue of the operation of the pump piston under air pressure. A pair of check valves seating inwardly in the discharge pipe and another pair of check valves seating outwardly in the intake port and its related standpipe cut off the liquid discharge positively at the end of each discharge even if one of a pair of valves fails to seat fully, thus assuring exactly the same amount of liquid being dispensed in every operation.

3,586,036
FLOW CONTROL VALVE
Gene A. Barnes, Skokie, Ill., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Nov. 26, 1969, Ser. No. 880,284
Int. Cl. F16k 17/22
U.S. Cl. 137—486 13 Claims



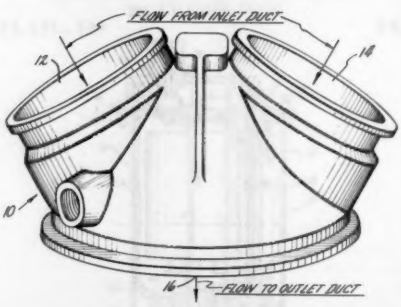
Adjustable flow control valve maintaining a preselected constant flow rate with changing inlet pressures and viscosity of the fluid flowing through the valve. The valve includes a pilot control mechanism and a servocontrol mechanism. These mechanisms are in the form of diaphragms subjected to inlet pressure and spring loaded to bias the diaphragms against inlet pressure with a predetermined force. An orifice, the area of which may be preselected, conducts fluid from the inlet or upstream sides of the diaphragms to the downstream sides of the diaphragms. A higher spring acts on the servo diaphragm than on the pilot diaphragm. The diaphragms each have a valve as a part of the diaphragm. As inlet pressure increases the diaphragm valves will move toward seats against the forces of the springs loading the diaphragms and the pressure of the fluid on the downstream side of the pilot and servo diaphragms. The orifice is in the form of a contoured hole wiped by a thin metal cam, to cause a change in orifice area and change in flow, as required.

3,586,037
SINGLE STAGE, COMPENSATED PRESSURE REGULATOR
Ray R. Zimmer, Lewisville, Tex., assignor to Victor Equipment Company, Denton, Tex.
Filed May 26, 1969, Ser. No. 827,711
Int. Cl. F16k 31/365
U.S. Cl. 137—505.18 10 Claims



This specification discloses a single stage, compensated pressure regulator characterized by having the pressure in a lower cylindrical aperture beneath a shaft of a core body vented through the small shaft and core body such that it is the same pressure as in the low-pressure chamber connected with an outlet, and by having the high inlet pressure blocked from the lower cylindrical aperture. Also disclosed is a particularly preferred embodiment in which roll pin stock is employed as a stem for the core assembly, effecting communication between the low-pressure chamber and the lower cylindrical aperture without the expense of forming component parts of extremely close tolerances, and without requiring minute care and skilled workmanship. Specific details of construction are included in the disclosures.

3,586,038
Y CHECK VALVE
George W. Jahrstorfer, Wapping, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.
Filed Oct. 10, 1969, Ser. No. 865,364
Int. Cl. F16k 15/03
U.S. Cl. 137—512 1 Claim




A pneumatic check valve assembly having a housing with an outlet and two converging inlets. Two pivotally mounted valve flapper assemblies are movable through respective arcs which define acute angles. Two valve seats are respectively formed on the peripheral interiors of the inlets and a fixed bracket is mounted within the housing in alignment with the outlet. The valve flappers are pivoted on the bracket and abut an extension on the bracket during normal flow through

the inlets to the outlet, but seat against their respective seats during reverse flow in the outlet.

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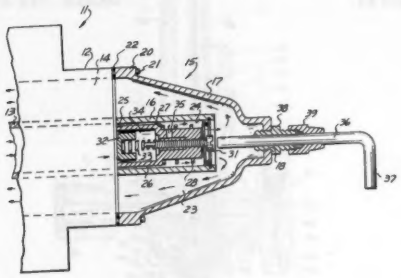
**3,586,039**
**DIESEL FUEL PUMP REGULATOR AND R.P.M. CONTROL**
**Henry N. Brumm, 20301 Telegraph Road, Southfield, Mich.**
**Filed May 9, 1969, Ser. No. 823,341**
**Int. Cl. F16k** *15/00, 17/00, 21/04*
**U.S. Cl. 137—513.7** **3 Claims**



In a fuel regulator and r.p.m. control for a Cummings diesel engine P.T. fuel pump which has a fuel flow and pressure controlled regulator which normally limits the maximum flow of regulated fuel by spring resisted longitudinal movement of a fuel regulator tube to limit maximum engine r.p.m.; the improvement which consists of a longitudinally adjustable r.p.m. increase adjustment pin which projects into said regulator and can prevent such maximum longitudinal control movements of said regulator tube to permit increased r.p.m of said diesel engine. P.T. as referred to in the trade means Pressure Time.

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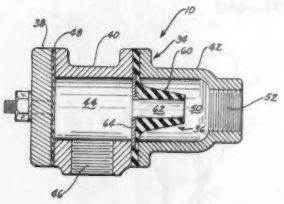
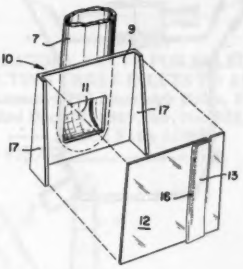
**3,586,040**
**VALVE MEANS**
**Leonard L. Urback, Waterloo, Iowa, assignor to Construction Machinery Company, Waterloo, Iowa**
**Continuation of application Ser. No. 604,771, Dec. 27, 1966, now abandoned. This application Nov. 6, 1969, Ser. No. 871,578**
**Int. Cl. F16k** *15/00*
**U.S. Cl. 137—517** **1 Claim**



An air bleed valve for a pump including a housing having an intake opening in communication with the pump and a discharge opening. A conduit extends between the intake and discharge openings and has a normally open valve means provided therein which is adapted to close the conduit upon a predetermined pressure differential existing in the discharge and intake openings.

**3,586,041**
**FLUTTER CHECK VALVE**
**Martin Monestere, Lebanon, N.J., assignor to C. R. Bard Inc., Murray Hills, N.J.**
**Filed Jan. 7, 1970, Ser. No. 1,118**
**Int. Cl. F16k** *15/14*
**U.S. Cl. 137—525** **8 Claims**



A flutter check valve designed for use particularly in a body fluid drainage system, such as a closed urinary drainage system, comprising a relatively rigid frame having an opening in communication with the outlet end of a drainage conduit and a flexible film secured to the frame and covering the opening in a position to be pushed away from the opening by fluid from the drainage conduit and to thereafter return to closing position, preventing backflow of fluid into the conduit.

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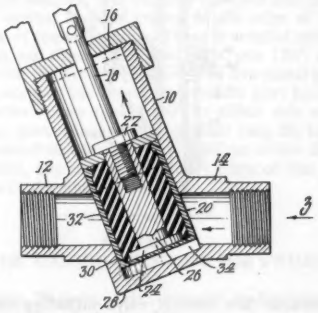
**3,586,042**
**SANITARY VALVE FOR VISCOUS MATERIALS**
**Wilfred J. Grenier, Rutland, Mass., assignor to General Industries, Inc., Worcester, Mass.**
**Filed Apr. 16, 1969, Ser. No. 816,556**
**Int. Cl. F16k** *3/24*
**U.S. Cl. 137—546** **2 Claims**



A gate or plug-type of valve including a housing and pipe connections, said housing having a chamber open at one side thereof and closed at the other side, and a gate or plug in said chamber, means for moving said plug axially to open and close the valve, the axis of the chamber and of the plug being coaxial and at an inclination with respect to the axis of the pipe connections and to the flow of the material therein.

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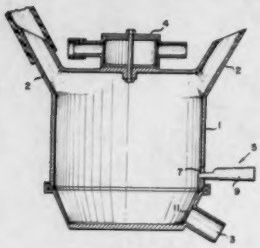
**3,586,043**
**MILKING APPARATUS WITH DUAL VALVE**
**Lloyd P. Duncan, Washington, Mo., assignor to Zero Manufacturing Company, Washington, Mo.**
**Filed Aug. 14, 1969, Ser. No. 850,033**
**Int. Cl. A01j** *7/00;* **F16k** *45/00*
**U.S. Cl. 137—587** **4 Claims**

A milking valve assembly including a housing with a milk outlet is normally under reduced pressure during milking

operation. A tapered valve is slidably fitted in an opening into the housing with a movable closure extending adjacent the outlet to open or close the milk outlet. Moving the



tapered valve to open the housing to ambient pressure simultaneously closes the milk outlet while sliding the tapered valve to close the opening during milking simultaneously opens the outlet.

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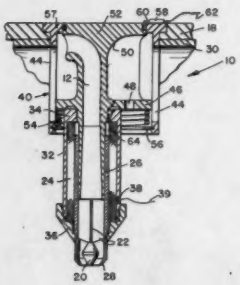
**3,586,044**

**SOLENOID FLOW CONTROL VALVE**

**Lester C. Petersen, Pasadena, Calif., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Sept. 26, 1969, Ser. No. 861,394**
**Int. Cl. F16k** *11/10*
**U.S. Cl. 137—590** **10 Claims**



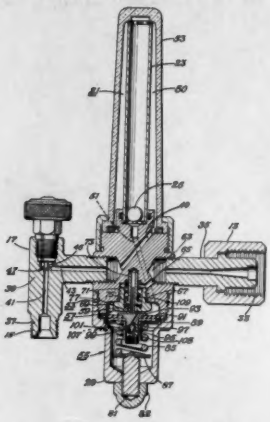
A solenoid flow control valve including an intake fluid conduit having an inlet and an outlet; a valve stopper mounted to the intake fluid conduit; a solenoid coil mounted about the intake fluid conduit; a hollow solenoid plunger slidably mounted between the solenoid coil and the intake fluid conduit so that fluid flow will forcibly slide the plunger downstream and energization of the coil will electromagnetically force the plunger to slide upstream; and the plunger having valve seat means for increasing fluid flow through the conduit when the coil is deenergized and decreasing fluid flow when the coil is energized. The control valve may include a frame assembly having a top opening and an exhaust fluid inlet located therebelow; the intake fluid conduit having a flange which slidably mounts the conduit in the frame assembly and the flange having an exhaust fluid passageway above the exhaust fluid inlet; the top end of the intake fluid conduit having a cap for sealably plugging the top opening of the frame assembly when the intake fluid conduit is slid to a downstream position; and means for biasing the intake fluid conduit to the upstream position.

**3,586,045**

**FLOW MEASURING DEVICE CONTROLLING BOTH PRESSURE AND FLOW RATE**

**Ray R. Zimmer, Lewisville, Tex., assignor to Victor Equipment Company, Denton, Tex.**

**Filed Oct. 7, 1969, Ser. No. 864,472**
**Int. Cl. F16k** *37/00;, 31/12*
**U.S. Cl. 137—551** **6 Claims**



A flow measuring device for providing a constant rate of flow of a fluid regardless of large variations in pressure of the source of the fluid at the inlet to the flow measuring device or variations in pressure of the fluid past the outlet connector therefor characterized by a unitary assembly adapted for installation in a small volume and including several elements. The elements include an inlet connector; an outlet connector; a valve connected with the outlet connector for regulating flow; a rotameter for measuring volume flow rate and sensitive to both volume and pressure changes, and connected with, but upstream of, the valve; and a single stage compensated regulator upstream of and connected with the rotameter, and connected with a high pressure source of the fluid, for preventing an increase in the rate of flow as measured by the rotameter when the pressure in the source of fluid drops. The flow measuring device is particularly useful on oxygen supply systems where the ordinary tendency is for the rotameter reading to increase as the pressure in the oxygen container decreases. Specific structure and embodiments are also disclosed.

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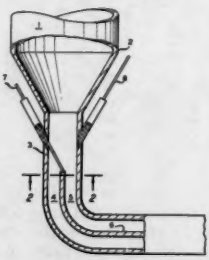
**3,586,046**

**CARBON BLACK RECOVERY APPARATUS**

**Roscoe R. Alford, Bartlesville, Okla., assignor to Phillips Petroleum Company**

**Filed May 1, 1969, Ser. No. 820,930**
**Int. Cl. F17d** *1/00;* **F16k** *11/14*
**U.S. Cl. 137—608** **7 Claims**



Carbon black ductwork between the reactor and the recovery facilities is disclosed. The ductwork is comprised of

a plurality of separate passageways of different areas, and means are supplied to select certain flow areas in order to maintain smoke velocities at values sufficient to prevent carbon black from settling out of the smoke.

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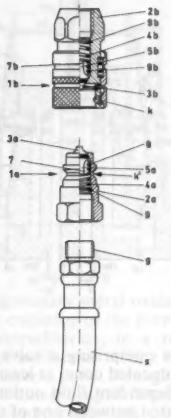
**3,586,047**
**DETACHABLE COUPLING**
**Kurt Ehrenberg, Munchner Strasse 4, Dietzenbach, Germany**
**Filed Sept. 18, 1968, Ser. No. 762,222**
**Claims priority, application Germany, Sept. 19, 1967, H63923XII/47f**
**Int. Cl. F16l *37/22; F16l 37/28***
**U.S. Cl. 137—614.04** **15 Claims**



A two-piece detachable hose coupling in which each coupling half comprises a cylindrical sleeve having a valve seat and a floating movable valve plug or body adapted to be urged against the seat by one or more coil springs, the coil spring or springs being connected to the valve body by means of thin plate pieces which do not appreciably reduce the cross-sectional area through which fluid may flow through the sleeve.

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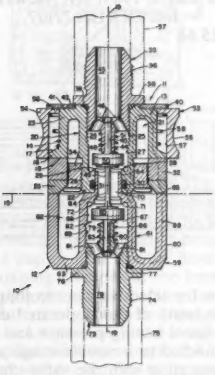
**3,586,048**
**MAGNETIC COUPLING**
**Kurt Herbert Arnold, West Caldwell, N.J., assignor to Valcor Engineering Corporation, Kenilworth, N.J.**
**Filed Jan. 8, 1969, Ser. No. 789,876**
**Int. Cl. F16l *29/00***
**U.S. Cl. 137—614.04** **11 Claims**



The present invention includes a valved magnetic coupling of a quick-disconnect type. The coupling includes first and second body members adapted to matingly engage with one another, a permanent magnet for inducing a primary magnetic flux path through the first and second body members when in a coupled position, thereby magnetically holding the body members in locked engagement with each other, and manually operable shunt means for diverting the primary magnetic flux path, thereby diminishing the magnitude of the magnetic force holding the body members in locked engagement.

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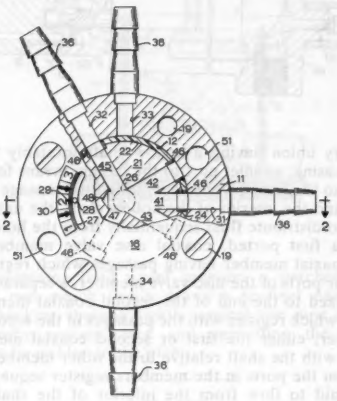
**3,586,049**
**OSCILLATORY VALVE FOR SELECTIVELY CONNECTING THREE INLETS TO AN OUTLET**
**Robert A. Adamson, 2493 Plumleigh Drive, Fremont, Calif.**
**Filed Dec. 29, 1969, Ser. No. 888,798**
**Int. Cl. F16k *11/08***
**U.S. Cl. 137—625.41** **6 Claims**



An open end, circular valve housing having a cover for the open end of the housing receives an oscillatory valve body with one annular seal partially recessed into the housing and bearing against a groove in the edge of one surface of the valve body and a second seal partially recessed into the cover and bearing against another groove in the edge of the opposite surface of the valve body. There is a radial outlet port in the housing and three radial inlet ports, one 120°, and two others 90°, from the outlet. The body has five radial ports intercommunicating at the center, the middle port having two adjacent (outlet) ports spaced 30° to either side and two remote (inlet) ports spaced 120° to either side. By turning a handle connected to the valve body 30° to either side of a central position, any of the three inlet ports of the housing may be connected to the outlet port.

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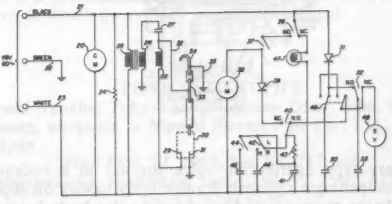
**3,586,050**
**AUTOMATIC GAS CHLORINATOR FOR SWIMMING POOL**
**John A. Totten, Phoenix, Ariz., assignor to Equipment Engineering and Manufacturing, Inc.**
**Filed Nov. 7, 1969, Ser. No. 874,822**
**Int. Cl. F16k *31/48***
**U.S. Cl. 137—624.15** **2 Claims**



In order to provide automatic and closely regulated chlorine content in swimming pools, timing apparatus is pro-

vided to achieve a scheduled plurality of metering rates for introducing gas chlorine into the water in accordance with the requirements dictated by use and environment.

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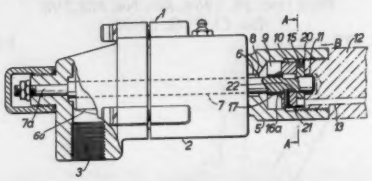
**3,586,051**
**ROTARY UNION**

**Gordon Richard Walker, and William Murray, both of Leamington Spa, England, assignors to Filton Limited, Leamington Spa, England**

**Filed Apr. 30, 1969, Ser. No. 820,549**
**Int. Cl. F16k *11/00*; F16l *27/00***
**U.S. Cl. 137—625.11** **6 Claims**



A rotary union having a hollow shaft rotatably mounted within a casing, an inlet port to the casing, means for sealing the shaft to the casing while permitting fluid passage between the port and the interior of the hollow shaft, the union being adapted to distribute fluid sequentially from the hollow shaft through a first ported, coaxial disc valve member and a second coaxial member having passages which register with the port or ports of the disc valve member, a separate disc or plate is fixed to the end of the second coaxial member and has ports which register with the passages in the second coaxial member, either the first or second coaxial members is rotatable with the shaft relative to the other member so that on rotation the ports in the members register sequentially to permit fluid to flow from the interior of the shaft axially through the ports in the first disc valve member and into the passages of the second coaxial member, whereby the separate disc or plate which is fixed to the second coaxial member can be quickly changed so that to allow selections of various sized and shaped ports for the second coaxial member.

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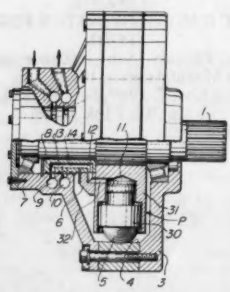
**3,586,052**
**ROTARY TYPE DISTRIBUTION VALVE FOR USE IN HYDRAULIC DEVICES**

**Katsuro Abe, Matsudo-shi, and Kozo Ono, Tokyo, both of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 27, 1969, Ser. No. 802,985**
**Claims priority, application Japan, Mar. 14, 1968, 43/16302**
**Int. Cl. F04b *1/10, 1/02***
**U.S. Cl. 137—625.23** **9 Claims**



A rotary type distribution valve for use in a hydraulic device comprising a cylindrical valve body having oil supply and discharge passages, and an annular valve body having a plurality of oil passages leading to the hydraulic device, said cylindrical and annular valve bodies being put in a sliding contact relationship at a distribution surface, means being provided for correcting the elastic deformation of the cylindrical valve body due to hydraulic oil pressure in the passages provided therein.

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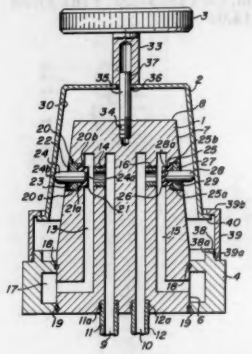
**3,586,053**
**MIXING VALVE**

**Ernest C. Browning, 2383 Zollinger Road, Columbus, Ohio**

**Filed Oct. 23, 1969, Ser. No. 868,699**
**Int. Cl. F16k *11/14***
**U.S. Cl. 137—636.4** **10 Claims**



A mixing valve comprising a valve body having the configuration of a truncated cone, at least two independent fluid inlets and an independent fluid outlet for each inlet. A first valve seat is located between one of the inlets and its outlet and a second valve seat is located between the other of the inlets and its outlet. Two plungerlike valve elements are reciprocally mounted in the valve body, each element having one end adapted to cooperate with one of the valve seats and a free end extending beyond the conical surface of the valve body. An actuator cap is mounted on the valve body and has an inner surface in the configuration of a truncated cone, adapted to contact the free ends of the valve elements. The actuator cap is movable vertically to regulate the flow of fluid from full on to full off. The conical inner surface of the actuator cap has at least one flat whereby rotation of the cap will regulate the fluid flow over the range between all from one outlet to all from the other outlet.

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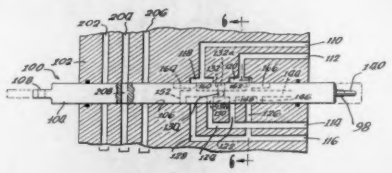
**3,586,054**
**TRANSMISSION CONTROL VALVE**

**Ronald G. Michael, West Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.**

**Filed May 2, 1969, Ser. No. 821,420**
**Int. Cl. F16k *11/07***
**U.S. Cl. 137—625.68** **16 Claims**



A control valve for selectively controlling the flow of fluid to and from a plurality of fluid operated devices. The valve includes a valve spool having pressure and return flow paths respectively connected to a reservoir and a fluid source and conduits communicating with the valve chamber in selected groups and at circumferentially spaced locations so that a plurality of devices may be simultaneously actuated from a single fluid source. The control valve also includes a separate group of conduits intersecting the chamber with a single

transverse opening adapted to allow flow through the valve when the spool is in selected conditions.

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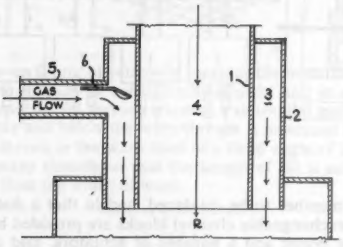
**3,586,055**
**METHOD AND APPARATUS FOR DISTRIBUTION OF GASES IN AN ANNULUS**

**William L. Wilson, Barberton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Division of Ser. No. 373,414, June 8, 1964, abandoned. This application Apr. 26, 1968, Ser. No. 724,571**
**No. 724,571**
**Int. Cl. F15d 1/02**
**U.S. Cl. 138—37** **7 Claims**




The production of pigmentary metal oxides, e.g., titanium dioxide, by vapor phase oxidation of the corresponding metal halide, e.g., titanium tetrachloride, in a reaction zone is described. The results of ineffective mixing of reactant gases introduced into the reaction zone through an annulus id discussed and a method comprising deflecting the gas as it enters the annulus proposed for effecting more uniform mixing in the reaction zone.

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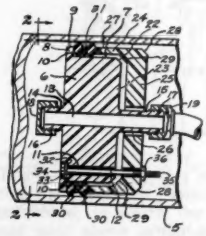
**3,586,056**
**PIPE PLUG**

**Fred L. Kipp, 7001 W. 69th St., Overland Park, Kans., and William L. Woodside, 9 N.E. 61st St., Apt. #27, Gladstone, Mo.**

**Filed May 16, 1969, Ser. No. 825,296**
**Int. Cl. F16l 55/10**
**U.S. Cl. 138—89** **9 Claims**



A pipe plug that is of a generally cylindrical character and has a cylindrical outer surface provided with a flat faced rib extending perpendicularly to the cylindrical surface at one margin of it. A passage extends through the body portion for fluid. Tubular extensions on the body portion are threaded for connection of a cap or of a flexible hose or similar conduit thereto. A clamping member in the form of an annular follower that is L-shaped in cross section has a portion that extends over and surrounds the cylindrical outer surface of the body portion, and a portion that extends inwardly from this portion that is adjustable relative to the body portion by bolts or similar screw-threaded fastening means. A pair of compressible sealing rings with a spacer ring between them, are mounted between the rib and the follower to be compressed by the follower when drawn toward the body portion by the bolts to distort them into sealing engagement with the inner cylindrical surface of a pipe, the plug being entirely inside the pipe with no modification of the pipe or any attachments to the pipe being required for mounting the plug in sealing position in the pipe.

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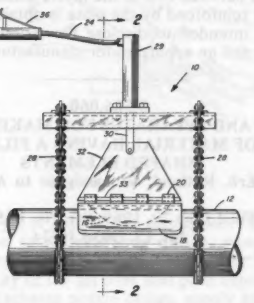
**3,586,057**
**FLUID ACTUATED PIPELINE PATCH**

**Lucian T. Lambert, Tulsa, Okla., assignor to William Basset, Fayetteville, Ark., a part interest**

**Filed July 25, 1969, Ser. No. 844,929**
**Int. Cl. F16l 55/16**
**U.S. Cl. 138—99** **3 Claims**



Pipe containing fluid under pressure is patched with a hydraulic ram which firmly draws a resilient pad with a metallic backing thereon tightly against the pipe over the hole thereby sealing same and permitting the metallic backing to be welded to the pipe.

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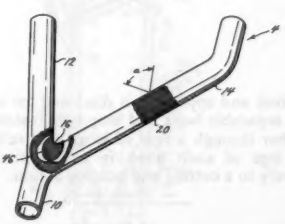
**3,586,058**
**HOLLOW BODIES AND METHOD OF FABRICATING THE SAME**

**Robert O. Ahrens, St. Louis; Erwin K. Welhart, Florissant, and William M. Jakway, Overland, all of, Mo., assignors to McDonnel Douglas Corporation, St. Louis, Mo.**

**Filed Sept. 25, 1968, Ser. No. 762,508**
**Int. Cl. F16l 55/00**
**U.S. Cl. 138—103** **10 Claims**



A hollow body is formed by braiding roving over a mandrel and impregnating the roving with a resin either before or after it is braided. When the resin cures it forms a fluidtight matrix in which the braided roving is imbedded.

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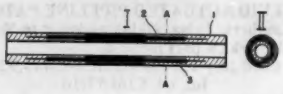
**3,586,059**
**FIBER-CEMENT PIPE**

**Kiyoshi Tanabe, Tokyo, and Mutsumu Oka, Yono, both of, Japan, assignors to Nippon Eternit Pipe Co., Ltd., Tokyo, Japan**

**Filed Mar. 12, 1968, Ser. No. 712,446**
**Claims priority, application Japan, Oct. 19, 1967, 42/88552**
**Int. Cl. F16s 9/08**
**U.S. Cl. 138—143** **7 Claims**

A small diameter asbestos-cement pipe has a small bending resisting strength in the longitudinal or axial direction of the

pipe. In order to overcome this defect, a thin plate is would together with the thin layers of asbestos-cement mixture when the latter is in the form of paste. The paste layers are wound around a core so as to fabricate a pipe, and the plate



is interposed between two of the layers whereby an asbestos-cement pipe reinforced by the plate is obtained. The present invention is intended to disclose the structure of the thus-formed pipe and an apparatus for manufacture thereof.

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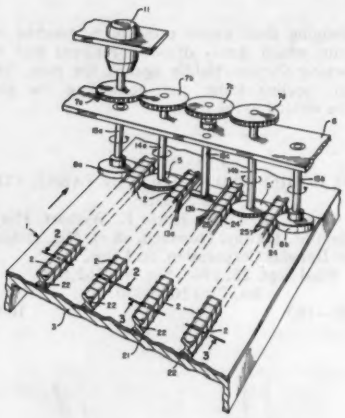
**3,586,060**

**METHOD AND APPARATUS FOR MAKING FLEXIBLE STRIPS OF MATERIAL HAVING A PILE OF HOOK-SHAPED ELEMENTS**

**George H. Erb, Rutland, Vt., assignor to American Velcro, Inc.**

**Filed June 20, 1969, Ser. No. 835,205**
**Int. Cl. D03d *39/24***
**U.S. Cl. 139—46** **15 Claims**



A method and apparatus is disclosed for making the hook part of a separable hook and loop-type fastener by inserting a backup bar through a row of loops and subjecting opposite vertical legs of each hook in a row simultaneously and respectively to a cutting and holding action.

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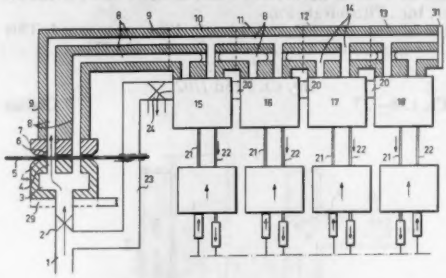
**3,586,061**

**CONTROL AND SELECTIVE MECHANISM FOR SELECTIVE THREADING MEMBERS IN KNITTING MACHINES, LOOMS, PATTERN MAKING MACHINES AND THE LIKE**

**William Eger Nyboe Lauritsen, Strandvagen 22, 44300, Lerum, Sweden**

**Filed Sept. 27, 1968, Ser. No. 763,273**
**Claims priority, application Sweden, Sept. 29, 1967, 13391/67**
**Int. Cl. D03c *13/00, 15/00;* F16k *11/00***
**U.S. Cl. 139—55** **9 Claims**

A servo-controlled selection mechanism operating on pressure variations, for selecting one or more of a number of displaceable operating members preferably in the form of pins or rods and intended primarily for magnetic operation. The operating members are included in the shedding mechanisms of looms, in jacquard machines, knitting machines, card punching machines, or the like. The novel matter of the invention resides in that the actuators for each operating member comprises blocking means in the form of a body which is displaceable through pressure variations and which in one position prevents and in another position permits the



operating member to be displaced, and in that a distributor including exchangeable channel blocks are provided between an impulse donor and a number of actuators, said channel blocks controlling the impulses from the impulse donor to the desired actuators mechanisms.

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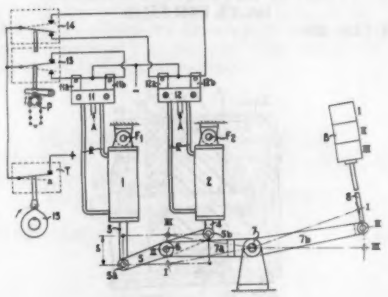
**3,586,062**

**LOOMS FOR WEAVING**

**Thomas Hindle, and Vincent Pinder Banks, both of Blackburn, England, assignors to Hindle, Son and Company Limited, Blackburn, England**

**Filed May 26, 1969, Ser. No. 827,615**
**Claims priority, application Great Britain, Mar. 22, 1969, 15,176/69**
**Int. Cl. D03d *43/04***
**U.S. Cl. 139—171** **9 Claims**



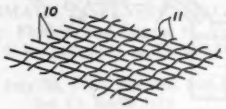
A multicell shuttle box supported by a lifter rod for movement to predetermined positions corresponding to the required positions of the shuttle box, a rocker arm, to one end of which the lifter rod is pivotally connected, a lever pivotally connected intermediate its ends to the other end of the rocker arm, a pair of cylinder and piston assemblies including rods, said rods being pivotally connected to the ends of the lever, and valves for supplying fluid pressure to the cylinders to effect reciprocation of the piston rods and hence movement of the shuttle box by way of the aforesaid connecting rocker arm and lever. Pairs of electromagnets provide for shifting the valves, switches connect the electromagnets to a source of power, said switches being adapted to be preset by means of a patterning device to effect movement of the shuttle box to the required positions, and a main power switch operable at a predetermined time in the loom cycle effects operation of the switches simultaneously.

3,586,063

## FABRIC AND METHOD FOR WEAVING

Robert P. Bell, Jr., Cary, N.C., and Marvin A. Eaton, Decatur, Ala., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 12, 1968, Ser. No. 774,966
Int. Cl. D03d 15/02
U.S. Cl. 139—425 5 Claims




A woven fabric of relatively inextensible materials wherein the warp threads lie substantially straight and in a common plane, and the fill threads traverse a sinusoidal path alternating above and below the warp threads is produced by placing the fill thread in the warp shed at a fixed angle of inclination to the warp threads so that the length of fill is substantially greater than the width of warp.

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3,586,064

## BLOOD SERUM COLLECTION TUBE AND METHOD OF COLLECTION

Paul A. Brown, Portsmouth, N.H., and Joseph O'Brien, Teaneck, N.J., assignors to Metropolitan Pathology Laboratory, Inc., Teaneck, N.J.

Filed Sept. 3, 1969, Ser. No. 854,982
Int. Cl. B01l 11/00
U.S. Cl. 141—1 11 Claims

The disclosure relates to an apparatus and a method for removing serum from the uppermost portions of a specimen tube of centrifuged blood, in which the blood serum is disposed in a liquid pool above settled-out cellular solid materials. More particularly, the invention is directed to an easily handleable, readily mailable, collection tube closed at both ends by "one-shot" valve structures comprising self-sealing elastomeric elements pierced by hollow needles. Additionally, at least the lower valve element is definitive of a pistonlike member which is adapted to engage the inner walls of the specimen tube to pump serum therefrom.

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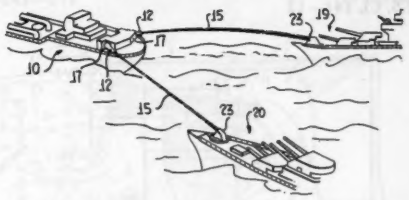
3,586,065

## FLUID TRANSFER METHODS AND SYSTEMS

Ronald E. Bowles, Silver Spring, Md., assignor to Bowles Fluidics Corporation

Filed Dec. 26, 1967, Ser. No. 693,581
Int. Cl. B63b 27/24
U.S. Cl. 141—1 14 Claims

Fluid is transferred from a supply station to one or more receiving stations separated from the supply station and in motion relative thereto, by directing a coherent, high-velocity, well-defined jet of the fluid from a discharge nozzle or nozzles, whose orientation may be varied according to the relative movement of the respective receiving station, toward and into a fluid catcher at the receiving station from which the received fluid may be distributed to appropriate storage




tanks. The fluid jet is unconfined throughout its path from the supply station to the receiving station, passing directly through the open space between the stations, the maintenance of integrity of the jet over that path depending upon such factors as discharge nozzle design, supply pressure, and viscosity of the fluid.

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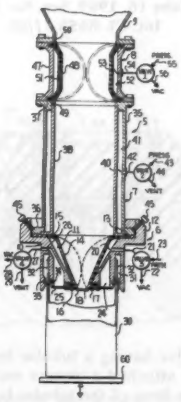
3,586,066

## METHOD OF FILLING FLEXIBLE CONTAINERS

Charles E. Brown, Cheverly, Md., assignor to Clarence W. Vogt, Weston, Conn.

Filed May 9, 1969, Ser. No. 823,298
Int. Cl. B65b 31/00
U.S. Cl. 141—5 9 Claims

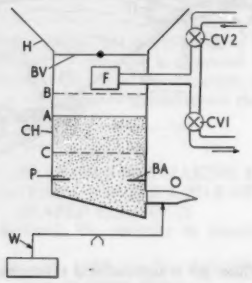


This disclosure relates to the filling of flexible containers with a finely divided material utilizing a filler providing a pressure differential including a vacuum in excess of that which effects a prohibited collapsing of the containers. A flexible container is sealed relative to the filler and the material is initially directed into the container under pressure to provide for an initial pressurization of the container, followed by the application of a vacuum to the container so as to permit the compact filling of the container without the collapsing of the container.

**3,586,067**
**METHOD AND APPARATUS FOR FILLING CONTAINERS**

**Han-Jorgen Bye-Jorgensen, Gravesend, Kent, England, assignor to Sack Fillers Limited, Northfleet,, Gravesend, Kent, England**

**Filed June 5, 1969, Ser. No. 830,626**
**Claims priority, application Great Britain, June 13, 1968, 28172/68**
**Int. Cl. B65b** *1/26*
**U.S. Cl. 141—12** **1 Claim**




This invention relates to a method and apparatus for densifying or compacting powder in a chamber and then transferring it to a container such as a sack, the method being that the powder is fed to a chamber where it is first subjected to a pressure below ambient pressure and then rapidly increasing the pressure, the increase of pressure may be used to feed the densified powder to the container, the apparatus comprises a chamber having a charging opening, an evacuating and pressurizing connection, and a connection for transferring the treated powder to the container.

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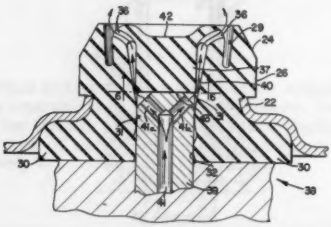
**3,586,068**
**ONE-PIECE VALVE**

**John B. Nicholson, Country Club Hills, Ill., assignor to Continental Can Company, Inc., New York, N.Y.**

**Filed June 16, 1969, Ser. No. 833,399**
**Int. Cl. B65b** *31/00*
**U.S. Cl. 141—20** **13 Claims**



A one-piece valve having a tubular body to one of which there is integrally attached a closure member which is compressed within the bore of the tubular body to seal the same when subjected to pressure forces acting on the end of the valve.

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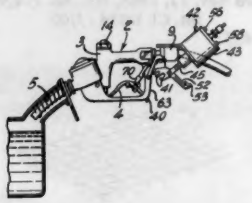
**3,586,069**
**AUTOMATIC DISPENSING NOZZLE**

**Eugene W. Vest, Wappingers Falls, and Dean C. McGahey, Fishkill, both of, N.Y., assignors to Texaco Inc., New York, N.Y.**

**Filed May 2, 1969, Ser. No. 821,366**
**Int. Cl. B65b** *3/24*; **B67d** *5/28, 5/372*
**U.S. Cl. 141—102** **5 Claims**

An automatic dispensing nozzle having means, in addition to the conventional vacuum responsive means for closing the main valve to reinstitute flow thru the nozzle at a relatively slow, predetermined rate suitable for carrying out the final or "topping-off"operation. With subsequent rise of fluid around the nozzle spout the resulting vacuum signal finally



shuts off the operation. There is a predetermined time delay following initial closure of the main valve and prior to reinstitution of flow, sufficient to permit initial subsidence of fluid from about the spout of the nozzle.

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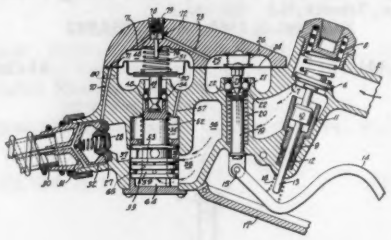
**3,586,070**
**AUTOMATIC DISPENSING NOZZLE**

**Moses B. Daniels, Jr., Wappingers Falls, N.Y., and Moses B. Daniels, Jr., Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.**

**Filed May 21, 1969, Ser. No. 826,313**
**Int. Cl. B65b** *3/26, 3/26*
**U.S. Cl. 141—128** **7 Claims**



A liquid dispensing nozzle in which a vacuum signal set up by the rise of liquid about the nozzle controls closure of both the main valve and of a supplemental valve which is actuated to automatically effect the "topping-off" operation at a relatively restricted rate of feed. The present invention provides a separate vacuum signal transfer valve which so controls the vacuum signal as first to actuate the supplemental valve to effect the "topping-off" operation and thereafter, on completion of the "topping-off" operation, to effect closure of the main valve.

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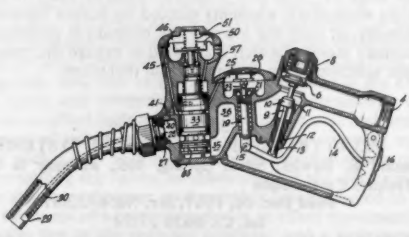
**3,586,071**
**AUTOMATIC DISPENSING NOZZLE**

**Dean C. McGahey, Fishkill, and Eugene W. Vest, Wappingers Falls, both of, N.Y., assignors to Texaco Inc., New York, N.Y.**

**Filed May 2, 1969, Ser. No. 821,364**
**Int. Cl. B67d** *5/373*
**U.S. Cl. 141—28** **9 Claims**



An automatic tank filling nozzle involving a device responsive to the surge of fluid about the end of the nozzle for clos-

ing the main valve, having, in addition thereto, a flow-regulating valve normally in full-flow position but which is caused by the initial surge of fluid about the nozzle, to move to a secondary valve position where fluid flow is restricted to a relatively low rate suitable for "topping." In the second or relatively restricted flow position of the flow-regulating valve the final rise of fluid about the nozzle acts to close off the main control valve.

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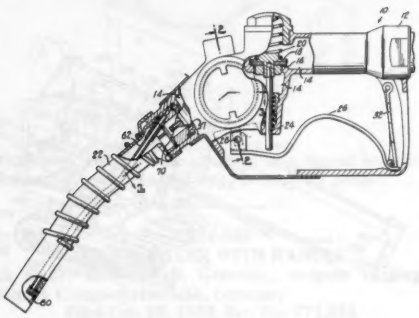
**3,586,072**
**AUTOMATIC DISPENSING NOZZLE**
**Dean C. McGahey, Fishkill, and Eugene W. Vest, Wappingers Falls, both of, N.Y., assignors to Texaco Inc., New York, N.Y.**
**Filed July 30, 1969, Ser. No. 846,099**
**Int. Cl. B65b** *3/26*
**U.S. Cl. 141—128** **5 Claims**



An automatic dispensing nozzle for liquid fuel of the type in which a main valve control lever is mounted on a fulcrum held in place by a quick release latch, responsive to a vacuum signal, wherein the latching device releases the fulcrum successively in two stages, in the first of which the main valve is closed to the point where flow is quite restricted, and in the final stage wherein the plunger is released to permit complete closure of the valve.

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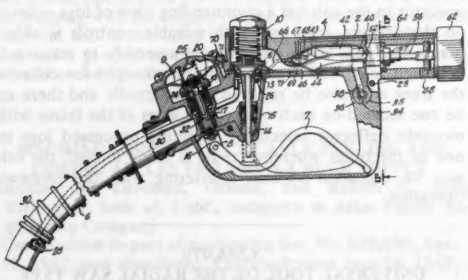
**3,586,073**
**AUTOMATIC DISPENSING NOZZLE**
**Eugene W. Vest, Wappingers Falls, and Dean C. McGahey, Fishkill, both of, N.Y., assignors to Texaco Inc., New York, N.Y.**
**Filed Oct. 29, 1968, Ser. No. 872,263**
**Int. Cl. B67d** *5/373*
**U.S. Cl. 141—128** **6 Claims**



An automatic fuel tank filling nozzle which, in addition to a main valve which automatically closes in response to a suction set up by the rise of fluid about the end of the nozzle, comprises a rotary flow-regulating valve having two alternate rotational positions, one permitting full flow of fuel thru the nozzle and the other permitting only a restricted flow suitable for topping, the rotary valve being rotated into the next alternate position in response to each vacuum signal whereas the main control valve is responsive only to the signal which follows the end of the topping operation.

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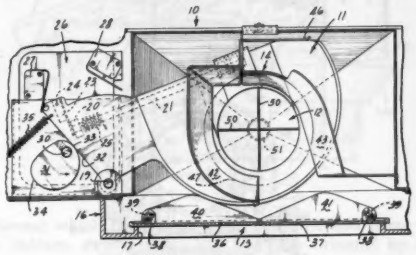
**3,586,074**
**CUP DISPENSING DEVICE**
**Irving F. Snyder, Anoka, Minn., assignor to The Cornelius Company, Anoka, Minn.**
**Filed May 7, 1968, Ser. No. 727,256**
**Int. Cl. G07f** *13/10*
**U.S. Cl. 141—271** **15 Claims**



A cup dispensing device includes a table having a subtable on which a cup is supported in alignment with filling means, the table being driven by a motor from a retracted position within a cabinet to a second position of greater accessibility for manual grasping of the cup, the cabinet having doors moved to an open position by such table, and there being a cup guide for aligning a cup with the filling means on the subtable, a portion of the cup guide being movable in response to table movement to provide a guide that encircles the cup during filling but releases the cup thereafter.

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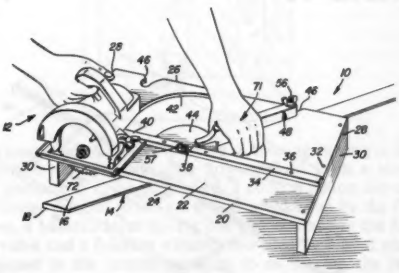
**3,586,075**
**MITER CUTTING DEVICE**
**Vern O. Larsen, 2640 Bonnie Bra, Casper, Wyo.**
**Filed Sept. 10, 1968, Ser. No. 758,892**
**Int. Cl. B27b** *5/20*
**U.S. Cl. 143—6** **6 Claims**



A first embodiment of the present invention includes a raised platform having an arcuate slot formed in the central portion thereof. A radial arm guide is connected to the platform in a manner permitting angular displacement of the same. A workpiece is positioned against the preadjusted radial arm guide and the slot permits one's hand to grasp or clamp the workpiece against the guide while a saw traverses the workpiece thereby forming a miter cut therein. Means are provided for forming a compound angle cut when desired. A second embodiment includes a raised platform identical to that of the first embodiment. However, a triangular, instead of an arcuate, slot is centrally formed within the platform and guide rails are disposed coincidentally with the peripheral edges of the triangular slot. To form a miter cut in a workpiece, the workpiece is positioned against a triangular

rail member and is clamped thereagainst by one's hand which passes through the triangular slot.

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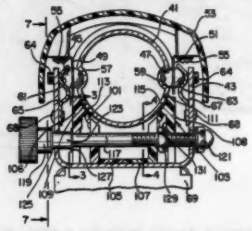
**3,586,076**
**RIP LOCK FOR RADIAL ARM SAW**
**Francis J. Rosenthal, Jr., Fork, and Leonard U. Alsruhe, Towson, both of, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.**
**Filed July 7, 1969, Ser. No. 839,446**
**Int. Cl. B27b** *5/20*
**U.S. Cl. 146—6 A** **2 Claims**



The device disclosed herein is a radial arm saw which includes a base frame having an upstanding column pivoted thereon about a generally vertical axis. A radial arm is rigid with the column and has a saw carriage supported thereon for movement therealong. TA motor driven saw is suspended from the carriage and is adapted to cut workpieces situated on a table supported upon the base frame.

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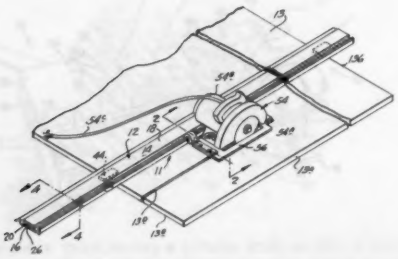
**3,586,077**
**CUTTING GUIDE MEANS FOR A PORTABLE POWERSAW**
**Mason E. Pease, Box 228, Pacific City, Oreg.**
**Filed July 3, 1969, Ser. No. 838,799**
**Int. Cl. B27b** *27/02*
**U.S. Cl. 143—6 G** **9 Claims**



Cutting guide means for a portable powersaw wherein the guide means comprises an elongated platelike bar having a downwardly opening bottom longitudinal rectangular groove slidably receiving the heads of a pair of clamping bolts. Large-diameter nylon clamping nuts are threaded on the bolts and are engageable beneath opposite ends of the faceplate of a portable powersaw, the brackets having downwardly facing channels slidably engageable on the top rib for guiding the saw in a cutting path parallel to the bar. The bar may also include a protractor disposed at one end thereof, the protractor including a pivoted abutment arm movable to preselected angles. Clamp means is provided for locking the protractor arm in a preselected position on the protractor.

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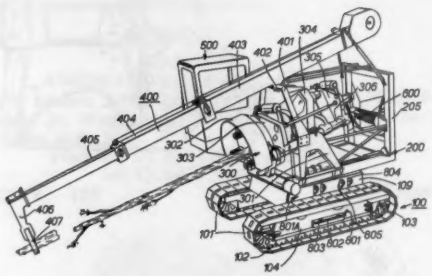
**3,586,078**
**TREE PROCESSING OFF-FEED ASSEMBLY**
**Douglas D. Hamilton, Town Mount Royal, and Domenico Benedetto, Montreal, both of, Canada, assignors to Canadian International Paper Company, Montreal, Quebec; Quebec North Shore Paper Company, West Montreal, Quebec and Abitibi St. Anne Paper Ltd., Beaupre, Quebec, Canada, part interest to each**
**Filed June 13, 1969, Ser. No. 833,021**
**Claims priority, application Canada, June 17, 1968, 022,728**
**Int. Cl. A01g** *23/02*
**U.S. Cl. 144—3 D** **20 Claims**



A tree processing machine including an attachment therefor to collect and unload logs discharged from the processing units on the machine. The tree collecting and unloading is a tree-handling off-feed assembly detachably secured either to the undercarriage of the vehicle or to a platform pivotally mounted on the carriage for movement with the processing units or pivotally mounted on the undercarriage to slew about a vertical axis independent of slewing of the platform on which the processing units are mounted. The off-feed assembly includes a pair of arcuate collecting arms in one form pivotally secured to the frame of the off-feed assembly so as to enable movement of the same when struck by an object during movement of the mobile tree processing machine. The off-feed mechanism further includes an operator's station consisting of a cab providing an enclosure for the operator and a boom and grapple assembly pivotally mounted thereon or adjacent thereto such that an operator in the cab has a commanding view of logs collected on the arcuate arms and with suitable controls is able to manipulate the boom and grapple assembly to remove the collected logs. The arms which are provided for collecting the trees may also be referred to as a cradle and there may be one located on each of opposite sides of the frame with a movable deflector selectively directing processed logs into one or the other whereby cradle is being loaded, the other may be unloaded without interfering with the processing operation.

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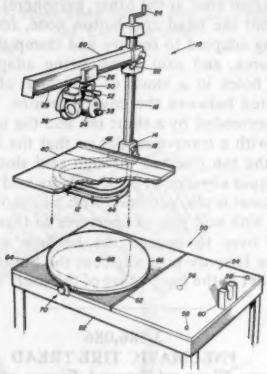
**3,586,079**
**UNIVERSAL TOOL OF THE RADIAL SAW TYPE**
**William A. Collins, Sr., and William A. Collins, Jr., both of 2920 Bauernwood Ave., Baltimore, Md.**
**Filed Jan. 22, 1969, Ser. No. 793,070**
**Int. Cl. B27c** *9/02*
**U.S. Cl. 144—35** **9 Claims**

An improved mounting base is disclosed which gives added flexibility to a universal tool such as a radial saw. Included in this mounting base is an indexing turntable having a center beneath the operating range of the tool. A hinge arrangement

is available to bring the turntable with the tool thereon to a position at 90° to the vertical. The radial arm thus becomes a



vertical ways and with the addition of a biased lever to the motor unit, provides an efficient vertical drill press.

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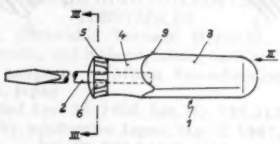
**3,586,080**
**SCREWDRIVER WITH HANDLE**
**Erich Slany, Esslineg-Zell, Germany, assignor to Stephan Witte & Company, Iserlohn, Germany**
**Filed Oct. 28, 1968, Ser. No. 771,032**
**Claims priority, application Germany, Feb. 21, 1968, Oct. 9, 1968, S64122/87aGbm;G6801480.2**
**Int. Cl. B25g** *1/10*
**U.S. Cl. 145—61** **8 Claims**



The disclosure is of a screwdriver having a handle for receiving and holding fast a tool shank, in which said handle comprises in combination a rear first portion which is of approximately triangular cross section throughout, a second portion adjoining said rear first portion in direction to said tool shank, said second portion being of round cross section for grasping with the fingers for the purpose of fine rotation when the ball of the hand is pressing on said rear first portion, and a gradual transition between said rear first portion and said second portion.

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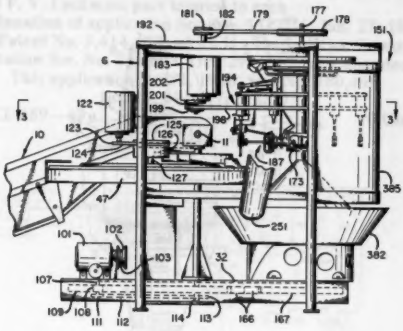
**3,586,081**
**MACHINE FOR AUTOMATICALLY PEELING AND CORING APPLES FED FROM A BULK SUPPLY**
**Malcolm W. Loveland, Orinda, and Robert G. Ellis, Richmond, both of, Calif., assignors to Atlas Pacific Engineering Company**
**Continuation-in-part of application Ser. No. 629,600, Apr. 10, 1967, now abandoned. This application June 16, 1969, Ser. No. 833,492**
**Int. Cl. A23n** *7/08, 3/12*
**U.S. Cl. 146—39** **31 Claims**

Apples are picked from a bulk supply and are fed continuously in single file order one at a time to a primary orientor, the first of two orientors. The primary orientor positions each apple with its two indents generally aligned on a vertical axis and its outer surface centered. However, the upper indent may or may not be in vertical alignment with the lower indent. The semioriented apples are then engaged by a second orienting mechanism which engages both indents of the apple to refine vertical alignment of the indents. Thereafter, each properly oriented apple is acted upon by peeling and coring



mechanism which removes the skin and core and trims the apple indents. Apples which are not fully oriented by the second stage orientor are rejected immediately so that only oriented apples are peeled and cored.

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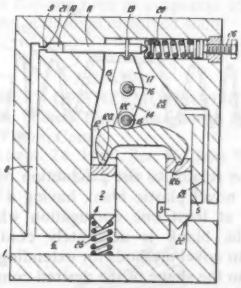
**3,586,082**
**PRESSURE-RELIEF VALVE**
**Horst Muller, Frankfurt am Main-Sossenheim, Germany, assignor to International Telephone and Telegraph Corporation, New York, N.Y.**
**Filed Nov. 21, 1969, Ser. No. 878,701**
**Claims priority, application Germany, Dec. 6, 1968, P1813167.4**
**Int. Cl. F16k** *17/06*
**U.S. Cl. 137—494** **11 Claims**



A pressure-relief valve including a housing having a slide valve which closes against the flow of fluid from a source whose pressure is to be controlled, a control piston movable in a cylinder parallel to the valve and acted upon by the fluid pressure, a balance lever having one end contacting the back of the valve and a fulcrum which is movable by a pilot piston in response to the source pressure so as to vary the lever ratio and allow the valve to open when the pressure exceeds a predetermined value. The opening pressure of the valve is variable over a wide range by changing the preload on a compression spring acting against the pilot piston.

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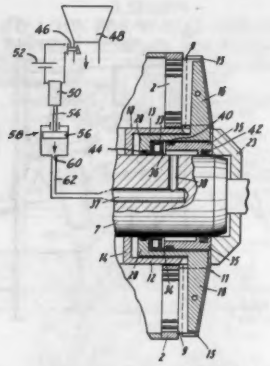
**3,586,083**
**MINCING MACHINE**
**Hans Neuner, Nurnberg, Germany, assignor to VEMAG Verdener Maschinen-und apparatebau GmbH, Nasse Strasse, Germany**
**Filed Feb. 26, 1969, Ser. No. 802,483**
**Claims priority, application Germany, Mar. 1, 1968, P 16 57 220.6**
**Int. Cl. B02c** *18/14, 18/18*
**U.S. Cl. 146—182** **18 Claims**

A mincing machine having at least one perforated disc and relatively rotatable blade means operably associated with

said disc. The blade means are carried by a blade-holder which is axially displaceable relative to the perforated disc.



Biasing means for biasing the blade-holder towards the disc so that the blades are resiliently pressed against the disc surface.

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**3,586,084**

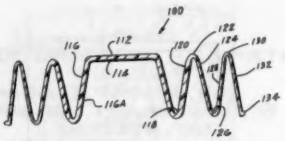
**PLASTIC BLANK FOR MAKING A CONTAINER**

**Sanford Redmond, 383 Concord Ave., Bronx, N.Y.**

**Continuation of application Ser. No. 618,975, Feb. 27, 1967, now abandoned, Continuation-in-part of application Ser. No. 537,933, Mar. 28, 1966, now abandoned. This application Dec. 5, 1969, Ser. No. 878,970**

**Int. Cl. B65d** *1/26*

**U.S. Cl. 150—.5** **6 Claims**



This invention relates to the production of hollow plastic articles from a novel plastic blank having a central portion surrounded by at least one corrugation wherein the wall thickness of the blank is accurately controlled or programmed, and to novel methods for extending and expanding such a blank into the shape of the desired container by applying a deforming force to extend the blank to produce a hollow article having substantially the height desired for the final container, and, thereafter, applying heat and pressure to expand the extended blank laterally to produce the final shape of the desired container.

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**3,586,085**

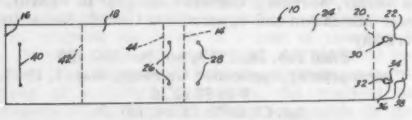
**WALLET FOR TRAVELERS' CHEQUES, OR THE LIKE**

**Albert H. Torongo, Jr., Yardley, Pa., assignor to American Express Company, New York, N.Y.**

**Filed June 6, 1969, Ser. No. 831,091**

**Int. Cl. A45c** *11/18*

**U.S. Cl. 150—38** **9 Claims**



A wallet for travelers' cheques, or the like, comprising a one-piece flexible and resilient cover having top and bottom portions connected by a fold, a pair of aligned apertures in said portions near said fold, a readily removable fastener post for securing a stack of travelers' cheques between said cover portions, said fastener post having a shank with a head at one end and a button nose at the other, peripheral grooves in said shank adjacent the head and button nose, respectively, said grooves being adapted to receive and clamp the walls of said cover apertures, and said shank being adapted to seat in prepunched holes in a stack of travelers' cheques to hold them protected between the cover portions. The bottom of the cover is extended by a short tab and the top of the cover is provided with a transverse slot so that the bottom may be folded and the tab inserted through said slot to form a flat book of cheques covered at both ends by said folds. The bottom of the cover is also provided with a keyhole-shaped aperture aligned with said pair of apertures so that the cover may be doubled over to engage the keyhole aperture in the groove of the fastener post adjacent the button nose for carrying the wallet in the hip pocket of the user.

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**3,586,086**

**PNEUMATIC TIRE TREAD**

**Jacques Boileau, Clermont-Ferrand, France, assignor to Compagnie Generale Des Etablissements Michelin raison sociale Michelin & Cie, Clermont-Ferrand (Puy-de-Dome), France**

**Filed Mar. 17, 1969, Ser. No. 807,593**

**Claims priority, application France, Mar. 18, 1968, Jan. 20, 1969, 144297;6900979**

**Int. Cl. B60c** *11/04*

**U.S. Cl. 152—209** **10 Claims**

The tread of a pneumatic tire is formed with circumferential grooves. The depth dimensions of the grooves are inclined with respect to the perpendicular to the tread. The angles of inclination are all within the range of 45° in one direction to 45° in the other direction.

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**3,586,087**

**TIRE**

**James W. Messerly, Stow, and Le Roy J. Vandenberg, Cuyahoga Falls, both of, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.**

**Filed Nov. 1, 1968, Ser. No. 772,837**

**Int. Cl. B60c** *1/00;* **C08c** *15/00*

**U.S. Cl. 152—330** **2 Claims**

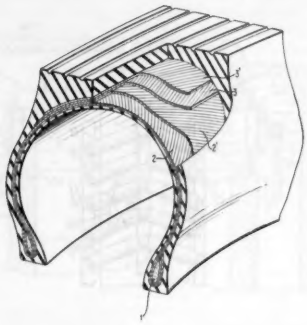
A superior tire, particularly of the tubeless variety, has a rubber/fabric carcass the inner air-contacting surfaces of which are lined or covered with an integral, extensible, vulcanized rubbery composition based on a blend of (1) a halogenated butyl rubber and (2) a rubbery epihalohydrin homopolymer such as polyepichlorohydrin plus a moderately high proportion of a soft, medium structure carbon black and said composition is cured or vulcanized by means of a nonsulfur curing system consisting of a mercaptoimidazoline curative and magnesium oxide. Such tires not only wear longer in service but also fail less frequently due to liner and/or intrafly separation because of superior resistance of the liner to air diffusion and all around greater integrity, stability and aging characteristics of the liner.

3,586,088

## PNEUMATIC TIRE

Taizo Hashida, Nishinomiya-shi, Japan, assignor to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed July 24, 1969, Ser. No. 844,341
Claims priority, application Japan, July 24, 1968, 43/52288
Int. Cl. B60c 9/06
U.S. Cl. 152—361 2 Claims



A pneumatic tire having at least one ply layer of polyester cord slanted with regard to the radial direction of the tire and at least one breaker layer between the ply layer and the tread layer formed of a polyvinyl alcohol-type synthetic fiber cord having a Young's modulus of 1,000 to 2,100 kg./mm.$^2$.

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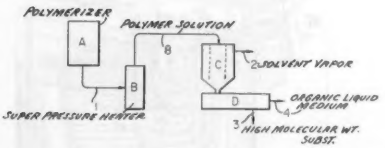
3,586,089

## METHOD AND APPARATUS FOR SEPARATING AND DRYING ORGANIC HIGH MOLECULAR WEIGHT SUBSTANCES

Motoo Mato, Otake-shi; Tsuyoshi Horiuchi, Iwakuni-shi; Koichi Enomoto, and Noboru Saitou, both of Otake-shi, all of, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 30, 1968, Ser. No. 725,313
Claims priority, application Japan, May 2, 1967, 42/27,693
Int. Cl. B01d 1/16, 1/18
U.S. Cl. 159—2 4 Claims



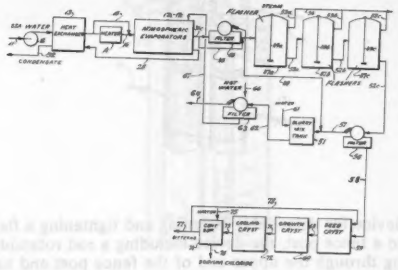

Improved method of separating a high molecular weight substance from a viscous liquid thereof, which comprises flashing said viscous liquid into a flashing zone from above via a partitioned baffle passage in said zone to cause said organic high molecular weight substance to adhere to said passage, from whence the high molecular weight substance is caused to drop to the bottom of the flash-drying tank along the inner wall of the baffle passage by means of gravity and the air pressure of the flash stream, and thereafter withdrawing the high molecular weight substance from the lower part of the flashing zone and, on the other hand, also withdrawing from the flashing zone said liquid medium which has been transformed into the vapor phase, and flash-drying apparatus suitable for practicing the method.

3,586,090

## METHOD FOR EVAPORATING BRINE

George L. Henderson, Seattle, Wash., assignor to Joseph B. Ward; Calvin B. Lake; M. T. Riback; George Henderson and F. V. Lockman, part interest to each

Continuation of application Ser. No. 532,036, Jan. 27, 1966, now Patent No. 3,414,483, which is a continuation-in-part of application Ser. No. 233,608, Oct. 29, 1962, now abandoned.
This application Dec. 2, 1968, Ser. No. 780,498
Int. Cl. B01d 1/22, 1/00
U.S. Cl. 159—49 10 Claims



A method is provided for evaporating brines, such as sea water, in a system in which the brine is transferred to successive evaporating zones wherein blocking of the transfer lines is avoided. Specifically, the amount of precipitation is limited to avoid slurry viscosities in excess of 150 centipoise and the velocity of the transferring slurry is maintained high enough to keep the slurry particles in suspension.

In one specific embodiment, the brine is first treated under atmospheric pressure to evaporate a portion of the liquid therein and to precipitate a substantial amount of solid. The brine is then transferred at its atmospheric boiling point to a reduced pressure flashing zone to evaporate additional liquid while precipitating additional dissolved solid.

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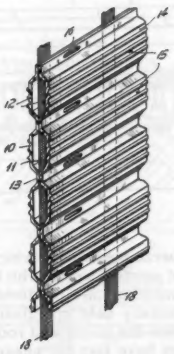
3,586,091

## BLIND OR SCREEN OF THERMOPLASTIC MATERIAL

Robert E. Roberts, Wilton, Conn., assignor to Fred T. Roberts & Company, Wilton, Conn.

Filed Sept. 24, 1969, Ser. No. 860,701
Int. Cl. E06b 9/00
U.S. Cl. 160—231 5 Claims

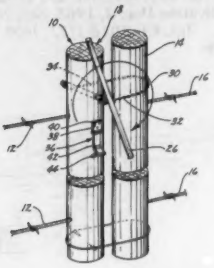



A highly effective blind or screen of thermoplastic material having slats joined by flexible lands, which lands are provided with vent openings. The blind or screen preferably has reinforcing members joined to the lands and forming the means for suspending the blind or screen in a pendant position. The slats can be formed of desired colors and can be embossed and of a solid or hollow construction, and if hollow may have a thermal insulation therein.

## 3,586,092
## GATE-FASTENING AND TIGHTENING DEVICE

Gilbert S. Chantland, RR#1, Tama, Iowa

Filed Sept. 25, 1969, Ser. No. 861,012
Int. Cl. E05c 5/00
U.S. Cl. 160—328 2 Claims

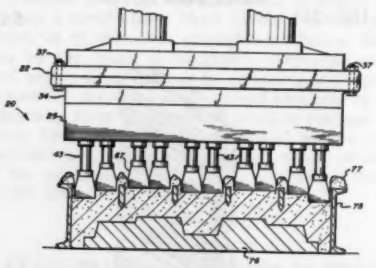


A device for detachably fastening and tightening a flexible gate to a fence post, the device including a rod rotatably extending through the upper end of the fence post and having its opposite ends exposed on opposite sides of the fence post. The free ends of the flexible U-shaped element are secured to the opposite ends of the rod and will be wound thereupon upon rotation thereof. The U-shaped element is extended over the upper end of the gate post and rotation of the rod by a handle secured thereto draws the U-shaped element and the gate post towards the fence post. A pivotal locking latch is secured to the fence post and is pivotal into the rotational path of the handle to prevent turning of the same so that the ends of the U-shaped element will not unwind from the rod to maintain the gate in a closed position.

## 3,586,093
## FOUNDRY SQUEEZE MECHANISM

Lester C. Young, Cleveland, Ohio, assignor to SPO, Incorporated

Filed Sept. 19, 1968, Ser. No. 760,829
Int. Cl. B22c 15/08
U.S. Cl. 164—173 4 Claims

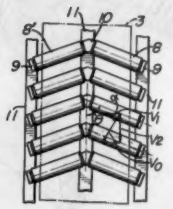


A foundry squeeze mechanism which includes a head having a plurality of cavities within which are positioned sleeve members. Rod members are positioned in the sleeve members and are normally held in a fixed position by an interference fit between the sleeve and rod members. One end of the rod members have feet for engaging sand in a foundry flask. Fluid passage means provide for the introduction of fluid pressure between the rod members and the sleeve members at the area of the interference fit and when so introduced the sleeve members are forced outwardly releasing the interference fits. Fluid pressure or other means on the other end of the rod members causes them to be extended. Seal means are provided on each side of the area of the interference fits and stop members are provided on the rod members to limit their extended movement.

## 3,586,094
## CONTINUOUS CASTING APPARATUS HAVING A ROLLER ARRANGEMENT FOR DIMINISHING THE RESTRAINING FORCE AGAINST SHRINKAGE OF THE CAST METAL

Kinju Machida, Hitachi-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 13, 1968, Ser. No. 783,625
Claims priority, application Japan, Dec. 22, 1962, Dec. 22, 1962, Dec. 22, 1962, 42/81875; 42/81878; 42/81879
Int. Cl. B22d 11/12
U.S. Cl. 164—282 13 Claims

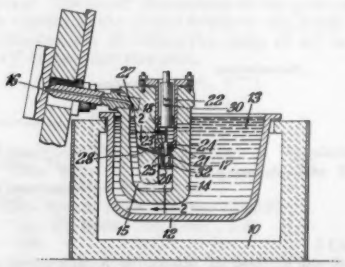


A continuous casting apparatus having means, in order to reduce a force created between the surfaces of a cast metal and each of guide rolls and acting in the direction to restrain a tendency of shrinking of the cast metal after it is discharged from a casting mould, for applying a force on the surface of the cast metal in the direction normal to the direction of travel of the cast metal and in the same direction as that in which the metal shrinks, whereby longitudinal splits can effectively be prevented.

## 3,586,095
## DIECASTING APPARATUS

Crescenzo F. Fulgenzi, Parma, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed June 20, 1969, Ser. No. 835,010
Int. Cl. B22d 17/04
U.S. Cl. 164—316 5 Claims



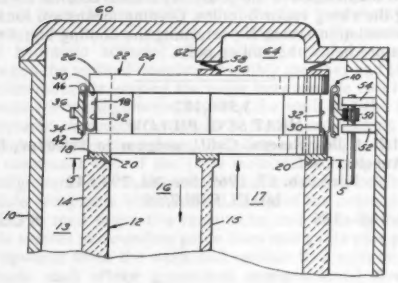
The subject invention relates to a novel shot cylinder-gooseneck assembly for diecasting pump wherein a vent passage is formed in the gooseneck wall so as to communicate between the discharge passage of the pump and the space between the shot cylinder and gooseneck wall in which the shot cylinder is mounted. A further improvement consists in the addition of a gasket at the base of the above-mentioned space for sealing off the lower end thereof from the gooseneck passage.

3,586,096

## GAS TURBINE HEAT EXCHANGING SYSTEM USING FLEXIBLE LOCATING MEMBERS FOR TORQUE TRANSMISSION

Arthur F. McLean, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 29, 1968, Ser. No. 756,236
Int. Cl. F16h *55/12, 55/14;* F28d *19/04*
U.S. Cl. 165—8 6 Claims



A porous ceramic regenerator core its in the shape of a 12-sided regular polygon is surrounded by a metal ring gear having gear teeth on its exterior surface. Locating members transmit driving torque from the ring gear to the core while permitting the core to move radially and axially relative to the ring gear. Narrow slots can be cut into the outer edge of the ceramic core to relieve thermally induced stresses.

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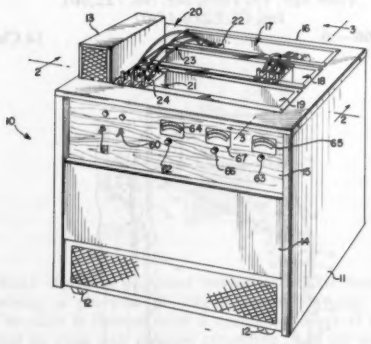
3,586,097

## PLASMA FREEZER

Charles E. Bender; Taylor N. Thompson, and Douglas S. Fraser, all of New Paltz, N.Y., assignors to Cenco Medical Health Supply Corporation, Chicago, Ill.

Filed June 6, 1969, Ser. No. 831,045
Int. Cl. F25b *29/00*
U.S. Cl. 165—17 12 Claims



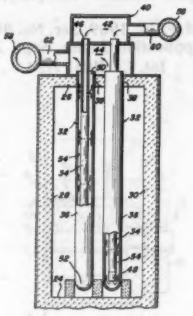
A plasma freezer for use in cryoprecipitation of antihemophilic factor from whole blood. Freezing and thawing tanks may be filled with novel cassettes containing plasma filled bags, while the associated red blood cells which have been separated by centrifuging are held at a uniform temperature to prevent deterioration.

3,586,098

## CONCENTRIC TUBE HEAT EXCHANGER

Gert Wellensiek, Hoesel, Germany, assignor to The American Schack Company Inc., Pittsburgh, Pa.

Filed Feb. 5, 1970, Ser. No. 8,841
Int. Cl. F28d *7/12*
U.S. Cl. 165—142 9 Claims



A multistage recuperator-type heat exchanger has a plurality of recuperator tubes suspended in an elongate recuperator chamber through which a heating gas flows. Each of the recuperator tubes has an inner tube concentrically positioned in an outer tube. The outer tube has a closed bottom end portion and an open upper end connected to a heated gas outlet compartment of a header. The inner tube has an open bottom end portion that terminates adjacent the closed bottom end of the outer tube and an open upper end connected to an inlet compartment of the header through which gas to be heated is introduced into the inner tube. The gas to be heated flows downwardly through the inner tube to the open bottom end upwardly in the annular passageway between the tubes and absorbs heat from the inner surface of the outer tube. Some of the recuperator tubes adjacent the heating gas inlet end of the recuperator, where the heating gas is at its highest temperature, have groups of spaced apertures therethrough around the circumference of the tube. The groups of apertures are located at different elevations along the length of the tube. A portion of the gas to be heated flows outwardly through the apertures and sweeps the inner surface of the outer tube at the different elevations and absorbs the heat from the outer tube and reduces the temperature thereof.

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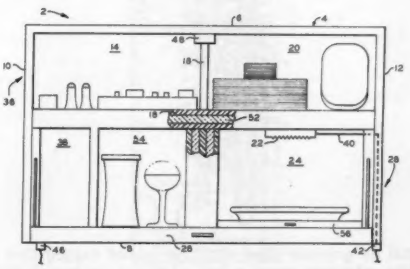
3,586,099

## SERVING APPARATUS

Stafford D. Collie, Kansas City, Mo., assignor to Phillips Petroleum Company

Filed Nov. 28, 1969, Ser. No. 880,687
Int. Cl. F25b *29/00*
U.S. Cl. 165—48 4 Claims



A storage and serving apparatus detachably affixed to a back of a passenger seat of a vehicle and having a plurality of

compartments. The apparatus including an insulated heating compartment, an insulated cooling compartment and an insulated serving tray for closing said compartments.

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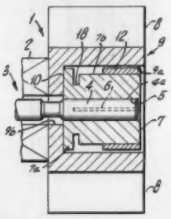
**3,586,100**

## HEAT DISSIPATING DEVICES FOR THE COLLECTORS OF ELECTRON-BEAM TUBE

**Susumu Yasuda, and Ryuzo Orui, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan**

**Filed Mar. 21, 1969, Ser. No. 809,258**
**Claims priority, application Japan, Sept. 28, 1968, 43/70585**
**Int. Cl. H01j** *7/24*
**U.S. Cl. 165—80** **7 Claims**



A heat-dissipating device for the collectors of electron-beam tubes such as a traveling wave tube. The collector slides loosely into a bore within a cylindrical heat-absorbing and conducting member. The heat-absorbing member is connected to a finned heat-radiating structure to which heat is conducted for dissipation. A tight fitting between the collector and the heat-absorbing member is created by the presence of a restraining collar placed around the heat-absorbing member. The collar has a smaller coefficient of expansion than the heat-absorbing member, and the heat-absorbing member has longitudinal slots therein, the net effect of which is to cause the heat-absorbing member to constrict about the collector when the assembly heats to operating temperature.

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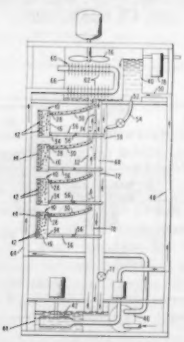
**3,586,101**

## COOLING SYSTEM FOR DATA PROCESSING EQUIPMENT

**Richard C. Chu, Poughkeepsie; Omkarnath R. Gupta, Poughkeepsie; Un-Pah Hwang, Poughkeepsie; Kevin P. Moran, Wappingers Falls, and Robert E. Simons, Poughkeepsie, all of, N.Y., assignors to International Business Machines Corpoation, Armonk, N.Y.**

**Filed Dec. 22, 1969, Ser. No. 887,080**
**Int. Cl. F28d** *15/00*
**U.S. Cl. 165—101** **8 Claims**



A plurality of electronic component modules to be cooled are located in each of a plurality of chambers through which a cooling liquid circulates by gravitational force from a buffer storage reservoir located at the top of said cooling system. Input connecting means are provided connecting each of the plurality of chambers to the above located buffer storage reservoir. A plurality of output conduits, all of the same length are provided, each connecting a respective one of said chambers to a phase-separation column. Nucleate boiling takes place at the hot components in the chambers and two-phase flow consisting of boiling vapor bubbles and cooling liquid passes through an output connection to a phase-separation column where the vapor bubbles rise and the liquid drops back into the circulation system. A condenser is located above the phase-separation column for condensing the rising vapor bubbles. Cooling means are located in the circulation means for returning the cooling liquid to a temperature below the boiling point.

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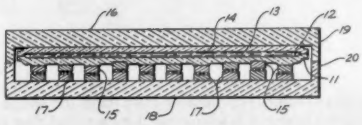
**3,586,102**

## HEAT SINK PILLOW

**Richard F. Gilles, Reseda, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.**

**Filed Feb. 17, 1969, Ser. No. 799,642**
**Int. Cl. F28f** *7/00*
**U.S. Cl. 165—186** **8 Claims**



The invention disclosed herein describes a thermal pad having a pair of strips of film being adhered to each other with a quantity of thermal grease or the like being encapsulated therebetween. The thermal pad is adapted to be inserted between a heat-dissipating component and a heat-sinking component to provide a highly efficient thermal path between the two components.

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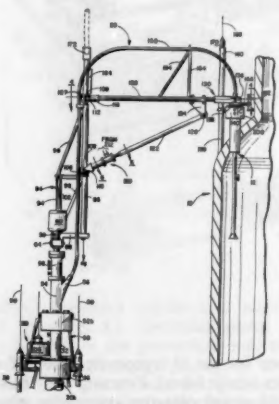
**3,586,103**

## COUPLING APPARATUS FOR COUPLING AN UNDERWATER OPERATING AND SERVICING MODULE TO A PLURALITY OF UNDERWATER WELLS THROUGH A SINGLE RECEPTACLE

**Walter Brown, and Warren S. Messinger, both of Long Beach, Calif., assignors to North American Rockwell Corporation**

**Filed Apr. 17, 1968, Ser. No. 722,001**
**Int. Cl. E21b** *43/01*
**U.S. Cl. 166—.6** **14 Claims**



This invention is directed towards a coupling apparatus for coupling an underwater operating and servicing module

through a single module receptacle to a plurality of oil or gas wells. A single connector is adapted to mate with a receptacle on the module from a vertical position. Two or more well connectors are adapted to mate with wells in close proximity to the module. A plurality of flexible tubes connect the module connector to the plurality of well connectors. The ends of the plurality of tubes are arched downwards. A rigid crossbeam member having a variable length is fixedly attached between two well connectors. Pivotally attached to the rigid crossmember at substantially a midpoint is a vertical coupling assembly member which supports a first truss member. The truss member connects the module connector to the truss member. A second variable-length truss member extends from the connector end of the first truss member to a lower point on the vertical coupling assembly member. A first hydraulic actuator and locking means is connected between the vertical coupling assembly member and the rigid crossmember for varying the angle between the two to compensate for misalignments between the wells and the module receptacle. A second hydraulic actuator and locking means extends between the vertical coupling assembly member and the connector end of the truss member to compensate for misalignments and to hold the module connector off from the module receptacle when desired. Each of the connectors are guided to their respective receptacles and wells by means of guide sleeves surrounding guide lines and guide pins projecting upwards from the wells and module to a surface vessel. Because each of the connectors are positioned downward such that they mate from a vertical direction, the weight of the connectors and coupling assembly forces the connectors into position at their respective receptacles and they are then locked into position by hydraulic or electric means controlled from either within the module or from the surface vessel. Tools for servicing and operating the wells may then be inserted into the coupling assembly through the module and coupled from there to the wells.

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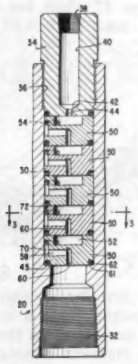
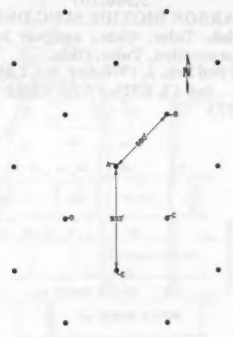
**3,586,104**
**FLUIDIC VORTEX CHOKE**
**Walter E. Hyde, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.**
**Filed Dec. 1, 1969, Ser. No. 881,003**
**Int. Cl. E21b** *49/00*
**U.S. Cl. 166—142** **17 Claims**



A fluid choke is provided having a tubular housing and comprising a plurality of staged vortex forming modules. Each module is formed with a vortex chamber at one axial end and an axial sink passage extending from the other axial end partially through the axial thickness of the module. Various passageways connect the axial sink with the chamber to direct a stream of fluid inwardly through the axial sink and tangentially into the chamber wherein vortical currents are formed. The fluid dissipates kinetic energy within the chamber before rising and passing into an axial sink of an upper next adjacent module of the staged series. When fluid flows in the opposite direction, no vortex currents are formed and so the kinetic energy of the fluid is not dissipated except for normal frictional losses.

**3,586,105**
**DETECTING CHANGES IN ROCK PROPERTIES IN A FORMATION BY PULSE TESTING**
**Carlton R. Johnson, Houston; Saul Vela, Houston; Edward G. Woods, Houston, and Aaron E. Pierce, Humble, all of, Tex., assignors to Esso Production Research Company**
**Filed Sept. 30, 1969, Ser. No. 862,225**
**Int. Cl. E21b** *49/100*
**U.S. Cl. 166—250** **11 Claims**



A method of detecting induced changes in the rock properties of subterranean formations. The preferred use of the method is in determining the presence and orientation of induced fractures in the formation. In this use of this method, the formation is first pulse tested between the well to be fractured and at least one additional well. Preferably the pulse tests are conducted between the well to be fractured and at least three surrounding wells which are in noncollinear directions from the first well. The first well is then fractured and a second series of pulse tests between the fractured well and the other wells is conducted. The presence and orientation of the fracture can be determined by comparison of the pulse tests within the formation before and after fracturing.

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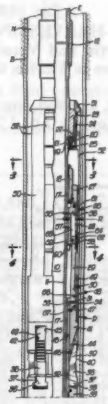
**3,586,106**
**RETRIEVABLE WELL PACKER**
**Martin B. Conrad, Carpinteria, Calif., assignor to Baker Oil Tools, Inc., Commerce, Calif.**
**Filed Oct. 13, 1969, Ser. No. 865,614**
**Int. Cl. E21b** *33/129*
**U.S. Cl. 166—120** **14 Claims**



A well packer having an inner body carrying an initially retracted packing structure and a lower expander and associated slips expanded against a well casing by setting down on a tubing string attached to the inner body. An outer body surrounds and is spaced from the inner body to form a bypass

passage therewith, the outer body carrying upper slips and an upper expander responsive to pressure in the bypass passage to shift the upper expander downwardly and expand the upper slips against the casing to anchor the packer against upward movement therein. The inner body and upper expander are attached to parts that coengage to prevent inadvertent downward shifting of the upper expander and expansion of the upper slips.

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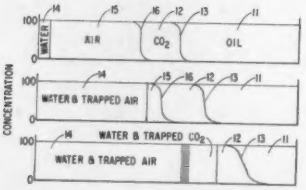
**3,586,107**
**CARBON DIOXIDE SLUG DRIVE**
**David R. Parrish, Tulsa, Okla., assignor to Pan American Petroleum Corporation, Tulsa, Okla.**
**Filed Feb. 2, 1970, Ser. No. 7,481**
**Int. Cl. E21b** *43/20, 43/22*
**U.S. Cl. 166—273** **6 Claims**




A slug drive to recover medium- to high-gravity petroleum from underground formations is carried out by injecting $CO_2$ into the petroliferous formation. A typical amount used is of the order of 5 percent to 20 percent, say, 10 percent of the pore volume of the hydrocarbons present in the portion of the reservoir being treated. This $CO_2$ is immediately followed by approximately an equal volume of air or flue gas, and then by water. Flue gas may be injected after or with the water. The gas immediately following the $CO_2$ (flue gas or air) very effectively displaces the $CO_2$ which is miscible with the petroleum of the reservoir. The following gas is both cheaper than the $CO_2$ and serves as a protective bank, since the gas immediately ahead of the waterflood is to a degree trapped in passing through the reservoir. An additional benefit obtained by driving the $CO_2$ bank with a gas (air or flue gas) less soluble in water is an improvement in mobility ratio, hence in sweep efficiency.

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**ERRATUM**

For Class 166—292 see:
Patent No. 3,586,524

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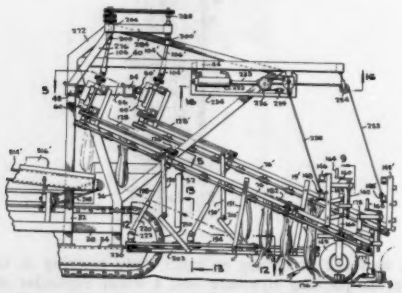
**3,586,108**
**CELERY-HARVESTING MACHINE**
**George H. Wedgeworth, and Vernie A. Boots, both of Belle Glade, Fla., assignors to Florida Celery Exchange, Orlando, Fla.**
**Filed Oct. 1, 1969, Ser. No. 862,810**
**Int. Cl. A01d** *27/04*
**U.S. Cl. 171—32** **16 Claims**



A celery-harvesting machine in the form of a self-propelled vehicle supporting a plurality of harvester units each such unit having two grip belts for engaging the top of a celery plant and lifting the plant from the soil and cutting means for severing the plant from its roots immediately below ground level following gripping of the plant by the grip belt with a lower outer foliage removing pair of belts for subsequently engaging the lower portion of the plant for stripping the outer foliage from the plant and transversely extending conveyor means for receiving the harvested plant and conveying the harvested plant to a central unloading station.

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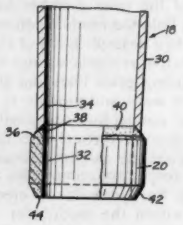
**3,586,109**
**TINE**
**William C. Eversole, Latrobe, and John F. Kita, Greensburg, both of, Pa., assignors to Kennametal Inc., Latrobe, Pa.**
**Filed Mar. 18, 1969, Ser. No. 808,177**
**Int. Cl. A01b** *45/02*
**U.S. Cl. 172—22** **7 Claims**




The invention concerns a tubelike tine for being driven endwise into the turf, especially the turf of golf greens, and is characterized by the provision of an extremely hard wear-resistant element fixed to the working end of the tine.

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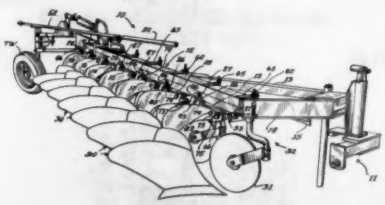
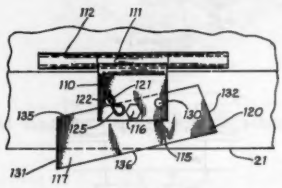
**3,586,110**
**TRIP MECHANISM FOR GROUND WORKING IMPLEMENT**
**Richard J. King, Rockford, Ill., assignor to J.I. Case Company**
**Filed Sept. 27, 1968, Ser. No. 763,203**
**Int. Cl. A01b** *61/04*
**U.S. Cl. 172—269** **3 Claims**



A tillage implement having a plurality of spaced ground working tools, with safety trip means for each tool allowing the tool to move from a normal ground penetrating position to a position elevated thereabove when an obstruction, such as a rock or a stump, is encountered. Each ground working tool is mounted for free swinging movement between the ground penetrating position and a fully elevated position above the ground, and the tool is positively guided to and from the ground working position, with the guiding means functioning to allow the ground working tool to initially move out of the ground penetrating position without substantial downward movement into the ground, and with the guiding means also functioning to direct the ground working tool back into the ground at the proper angle of reentry. Spring biased latch means releasably retain each of the ground working tools in the operating ground penetrating position.

**3,586,111**
**LANDSCAPING APPARATUS INCLUDING A SOD NOTCHER BLADE**
**Carl D. Jackson, Fortville, Ind., assignor to C.D. Jackson Manufacturing Company, Fortville, Ind.**
**Filed Feb. 6, 1969, Ser. No. 797,085**
**Int. Cl. A01b** *49/02*
**U.S. Cl. 172—146** **6 Claims**




Landscaping apparatus including a bucket having a lower scraping edge at the rear of the bucket, plow blades at the front of the bucket, raking tines between the scraping edge and the plow blades, and a roller mounted to the rear of the bucket rear. A sod notcher blade is mounted inside the bucket for placing a notch or groove in the ground beside a walk. A spring-biased snap-action locking means is provided for selectively locking the raking tines into and out of operating position. A chain is selectively connected between the bucket and the roller for placing all of the weight of the bucket on the roller. The plow blades are spring biased into their forward position.

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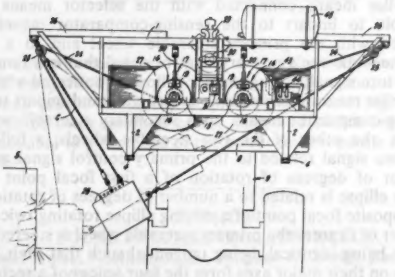
**3,586,112**
**MACHINE FOR DEMOLISHING STRUCTURES**
**Aaron L. Kelley, 235 11th St., Merced, Calif.**
**Filed Oct. 17, 1969, Ser. No. 867,263**
**Int. Cl. E02d** *7/06*
**U.S. Cl. 173—29** **5 Claims**



A machine, for demolishing structures, such as is characterized by the inclusion of a heavy impact or "destruction" ball suspended in a manner so that it can be swung laterally or dropped vertically against a structure to be demolished; the machine being relatively small and compact, readily portable from place to place, self-powered, and adapted to be mounted as a unit on—and elevated above ground by—the vertically movable scoop of a front-end loader of tractor type, and with said machine then remote controlled from the operator's station on the tractor.

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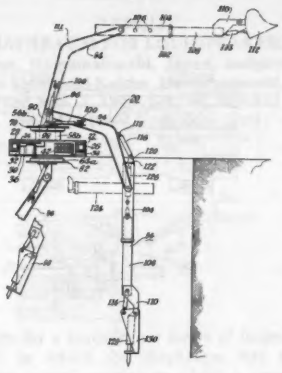
**3,586,113**
**DEMOLITION AND SCOOPING MACHINE**
**Louis A. Grant, 7886 Saltburg Road, Pittsburgh, Pa.**
**Filed Mar. 19, 1969, Ser. No. 808,607**
**Int. Cl. E21c** *11/00*
**U.S. Cl. 173—34** **14 Claims**

A demolition and scooping machine comprises a rigid supporting structure with a rotatable turntable mounted thereon. A clamp mechanism is provided for clamping the supporting structure to external supports. A boom assembly including an elbow section is pivoted on an upper surface of the turntable, and includes extensible boom structure pivoted at one of its ends to the outer end of the elbow section. Either a demolition tool or a scoop can be pivoted to the outer end of the extensible boom structure. The extensible boom structure and the elbow section are shaped such that the scoop or demolition tool can reach every point of at least the area directly beneath the supporting structure.



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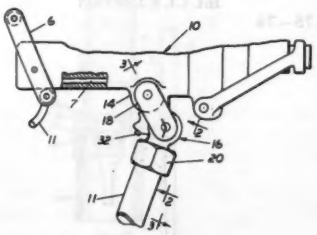
**3,586,114**
**FLUID CONTROL MEANS FOR ROCK DRILL FEED LEG**
**John E. Gordon, 337 Main St. E., Galt, Ontario, Canada**
**Filed Apr. 1, 1969, Ser. No. 811,910**
**Int. Cl. E21c** *5/11*
**U.S. Cl. 173—36** **7 Claims**




A pneumatic drill with a fluid operated extensible feed leg having a means therein responsive to a change of pressure to provide a quick pressure release for pressurized fluid in the feed leg.

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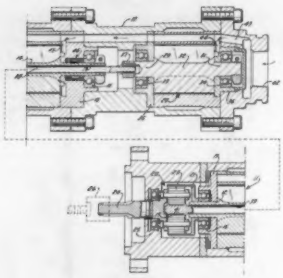
**3,586,115**
**TWO-SPEED DUAL DRIVE STALL TORQUE NUT RUNNING TOOL**
**Lester A. Amtsberg, Utica, and William K. Wallace, Barneveld, both of, N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.**
**Filed Oct. 29, 1969, Ser. No. 872,166**
**Int. Cl. B25b** *23/14*
**U.S. Cl. 173—163** **6 Claims**

A two-speed nut running tool having two separate air motors, one serving as a rundown motor; and the other as a torquing motor. Both motors are connected to a common output spindle through a common planetary gear system. The arrangement is such that the rundown motor drives the output spindle through a small gear reduction; and the torquing motor drives the spindle through a larger gear reduction. The motors operate concurrently in the same direction to drive

the spindle. The rundown motor provides an initial tightness to the work determined by the limits of its capacity and then stalls. The concurrently running torquing motor thereafter continues to tighten the work through the gear system. When a reactionary torque develops through the gear system tending to rotate the rundown motor in a reverse direction from its stalled condition, a one-way clutch responds to this action to restrain such reverse rotation. This enables the torquing motor to continue its torque delivery to the work until it has reached the limit of its capacity and stalls. The stall torque capacity of the torquing motor represents the maximum value of final torque delivered to the work.



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**3,586,116**

## DIRECTIONAL DRILLING EQUIPMENT

**Wladimir Tiraspolsky, Issy-les-moulineaux, and Roger Francois Rouviere, Aix en provence, both of, France, assignors to Turboservice Societe anonyme, Paris, France**

**Filed Apr. 1, 1969, Ser. No. 812,050**
**Int. Cl. E21b** *7/08*
**U.S. Cl. 175—74** **11 Claims**

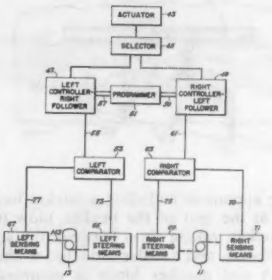
Directional drilling equipment is disclosed that employs a downhole motor to rotate the bit, while the drill string provides the weight on the bit. The equipment has a sleeve between the bit and the motor that has a bend or inflection point such that the bit makes the desired angle with the axis of the drill string. Torque from the motor is transmitted through the inflection point to the bit by a shaft and a dual universal joint housed in the sleeve. None of the weight on the bit or the end thrust of the motor is transmitted to the shaft.

**3,586,117**

## METHOD AND SYSTEM FOR STEERING A VEHICLE

**Ted L. Le Tourneau, Longview, Tex., assignor to R. G. Le Tourneau, Inc., Longview, Tex.**

**Continuation of application Ser. No. 768,998, Oct. 21, 1968, now abandoned. This application May 1, 1970, Ser. No. 31,858**
**Int. Cl. B62d** *5/04*
**U.S. Cl. 180—79.1** **33 Claims**




This specification discloses a system for steering a wheeled vehicle characterized by employing, in addition to two steerable wheels attached to the vehicle frame, steering means for separately steering each steerable wheel within a portion of a circle in response to a steer signal; two sensing-comparators, each connected with one of the wheel steering means and operable to generate a steer signal in response to a primary control signal or a follower response signal and to discontinue the steer signal when the associated wheel has been steered through the number of degrees equivalent to the respective signal; actuator means for starting a turn by generating a turn signal; selector means connected with the actuator means and operable, in response to the turn signal, to select one of the wheels as a primary steerable wheel and to impart to the associated controller means the turn signal; controller means connected with the selector means and operable to impart to the sensing-comparator means associated with the primary steerable wheel and to a programmer-follower a primary control signal that is a function of the turn signal; a programmer-follower connected with the controller means and operable to generate and impart to the sensing-comparator means on a secondary steerable wheel; that is, the other of the two steerable wheels; a follower response signal related to the primary control signal as the number of degrees of rotation of a first focal point of a driven ellipse is related to a number of degrees of rotation of the opposite focal point of a driving ellipse rotating twice the number of degrees the primary steerable wheel is steered; the ellipse being identical, being tangential such that their focal points on their major axes form the four apices of a rectangle at the position equivalent to 0° of steer, having a first set of two of the focal points opposite, disposed a fixed distance apart and located at points fixed in space, and having the other two of the focal points opposite and in fixed spaced relation but free to move in space.

The specification also describes a method of steering a vehicle, employing the unique follower response signal output from the programmer.

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**3,586,118**

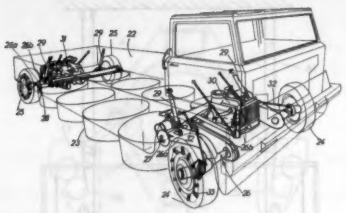
## GROUND-EFFECT MACHINES HAVING IMPROVED GUIDING AND PROPELLING MEANS

**Jean Henri Bertin, Neuilly-sur-seine, France, assignor to Bertin & Cie**

**Filed July 2, 1968, Ser. No. 741,991**
**Claims priority, application France, Jan. 17, 1961, 849,877**
**Int. Cl. B60v** *3/02*
**U.S. Cl. 180—119** **2 Claims**

A ground effect machine borne on the ground in part by one or more pressure fluid cushions an in part by one or more wheels for guiding and driving said machine, the degree

of ground engagement of said wheel or wheels being controllable by means of jacks, thereby to adjust the weight proportion of said machine shared by said cushion(s) and said wheel(s).



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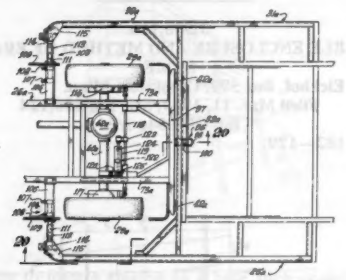
**3,586,119**
**POWER TRAIN AND TRAILER**
**Michael Chuchua, Fullerton, and George D. Greer, Hollywood, both of, Calif., assignors to Dale Gardner and Michael Chuchua, by said Greer, part interest to each**
**Continuation-in-part of application Ser. No. 569,482, Aug. 1, 1966, now abandoned. This application July 11, 1968, Ser. No. 744,114**
**Int. Cl. B60d** *7/00*
**U.S. Cl. 180—14** **6 Claims**



A two-wheeled house trailer and a four-wheeled power train for partially carrying and drawing the same, with connecting means for rigidly connecting the same together for transit of the combined power train and trailer but readily detachable to permit use of the power train separate from the trailer.

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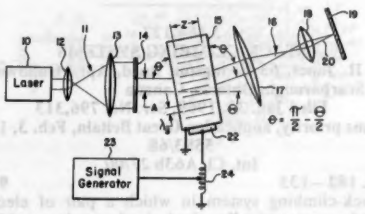
**3,586,120**
**SOUND PROPAGATING APPARATUS**
**Robert Adler, Northfield, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.**
**Division of Ser. No. 476,798, Aug. 3, 1965, Pat. No. 3,419,322. Filed July 16, 1968, Ser. No. 745,264**
**Int. Cl. G10k** *11/00*
**U.S. Cl. 181—.5** **17 Claims**




Light-beam scanning angles obtainable from light-sound interaction are increased by introducing dispersion of the sound waves. In one general approach, the sound waves are passed through a fixed grating or otherwise through a medium which is dispersive by reason of its character. In another general approach, vibrational dispersion is obtained by launching a longitudinal wave in response to either a shear wave or an extensional wave.

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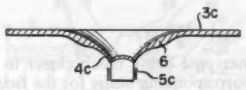
**3,586,121**
**DIAPHRAGM FOR LOUDSPEAKERS**
**Hiromi Sotome, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan**
**Filed Mar. 3, 1969, Ser. No. 803,822**
**Int. Cl. G10k** *13/00;* **H04r** *7/00*
**U.S. Cl. 181—32** **1 Claim**




A diaphragm for a loudspeaker made of foamed plastic or like material, in which the diaphragm has a decreased thickness at its central portion to which a voice coil is attached.

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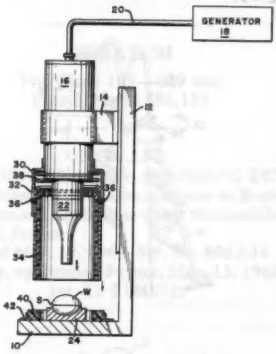
**3,586,122**
**SONIC APPARATUS WITH SONIC ENERGY BARRIER MEANS**
**Stanley E. Jacke, Ridgefield, Conn., assignor to Branson Instruments Incorporated, Stamford, Conn.**
**Filed Apr. 27, 1970, Ser. No. 31,966**
**Int. Cl. B29c** *27/08;* **B23k** *1/06;* **G10k** *11/00*
**U.S. Cl. 181—33** **8 Claims**




A sonic apparatus includes a sound-absorbing enclosure which is coupled to motive means for enclosing during the sonic energy transfer cycle a substantial part of the tool and workpiece in order to shield the ambient from undesirable radiated noise.

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**3,586,123**
**MUFFLER WITH SEQUENTIAL EXPANSION CHAMBERS**
**Huston R. Marlowe, Alameda; Donald L. Stephens, Los Gatos, and John B. Selvidge, Fremont, all of, Calif., assignors to Pacific Car and Foundry Company (Peterbilt Motors Company Division), Renton, Wash.**
**Filed Mar. 16, 1970, Ser. No. 19,935**
**Int. Cl. F01n** *1/02, 1/08, 1/12*
**U.S. Cl. 181—57** **10 Claims**

A muffler able to greatly reduce the exhaust sound of powerful truck engines without too greatly increasing the

back pressure. The large shell is concentric with first, second and third inner pipes that are axially aligned, and are spaced apart by a distance approximately equal to their diameter. The central inner pipe is much longer than the other two and, within the shell, all are perforated. Each one is supported by two annular baffle-support members. The central innner pipe has its baffles spaced in about one-third of the distance from each end. The axially inner members of each of the two end pairs of baffles are spaced different distances from the axially inner end of their respective inner pipes, that

of the third inner pipe being much closer to the end of the shell than the corresponding baffle for the first inner pipe. As a result, the distance between the axially inner baffle of the first pair is closer to its adjacent baffle of the second pair than is the axially inner baffle of the third pair to its adjacent baffle of the second pair. Hence a series of chambers of different sizes are formed. Further reduction of sound is achieved by dividing the inner pipes into radial sectors or by introducing the exhaust gases in a swirl, or by placing a flow restriction at the entrance end to the second pipe.

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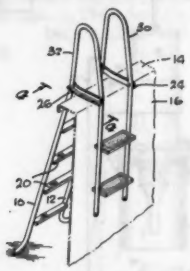
**3,586,124**

## SAFETY LADDER FOR ABOVE-GROUND SWIMMING POOL

**John J. Kunzweiler, Colton, and William A. Kershner, Upland, both of, Calif., assignors to HPE, Inc., Colton, Calif.**

**Filed Dec. 1, 1969, Ser. No. 881,000**
**Int. Cl. E06c 9/06**
**U.S. Cl. 182—97** **4 Claims**



An improved ladder assembly is provided for the aboveground type of swimming pool. The ladder of the invention may be bolted to the top edge of the side of the swimming pool, and the section of the ladder outside of the pool is pivotally mounted so that it may be swung up off the ground for safety reasons, and to prevent unattended children, for example, from climbing up the ladder and falling into the pool.

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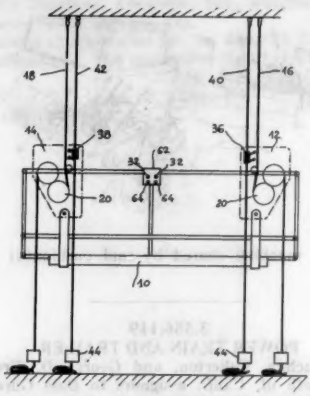
**3,586,125**

## SCAFFOLDING WINCH WITH MOTOR

**Marcel Durand, Grenoble, France, assignor to Jean Pomagalski S.A., Fontaine, France**

**Filed Mar. 24, 1970, Ser. No. 22,220**
**Claims priority, application France, Apr. 23, 1969, 6912934**
**Int. Cl. E04g 3/10**
**U.S. Cl. 182—112** **7 Claims**

A scaffolding motor winch with a safety device to prevent a falling of the scaffolding platform. The safety device control means are coupled to the motor control means for lower-



ing the platform to lock or unlock the safety device only when the motor is stopped.

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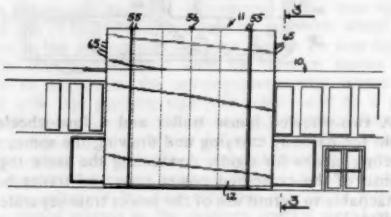
**3,586,126**

## PORTABLE ENCLOSURE AND METHOD OF ERECTING SAME

**John K. Eickhof, Box 599, Crookston, Minn.**

**Filed Mar. 11, 1969, Ser. No. 806,124**
**Int. Cl. E04g 1/26**
**U.S. Cl. 182—129** **7 Claims**



An elongated framework constructed with sufficient rigidity for mounting between a pair of shorings and depending scaffolding therefrom, a roll of flexible protective material affixed to the framework to produce at least a partial enclosure about a work area when in at least a partially unrolled position, and means affixed to the framework for supporting the roll of material and providing the rolling and unrolling action thereof.

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**3,586,127**

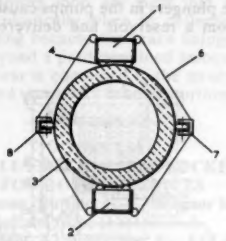
## STACK-CLIMBING SYSTEMS

**Robert H. Jones, 65 Livingston Road, Apt., Guildwood Village, Scarborough, Ontario, Canada**

**Filed Jan. 31, 1969, Ser. No. 796,313**
**Claims priority, application Great Britain, Feb. 3, 1968, 5583/68**
**Int. Cl. A63b 27/00**
**U.S. Cl. 182—133** **9 Claims**

A stack-climbing system in which a pair of electrically propelled, pneumatically tired load-carrying vehicles is adapted to be held in diametrical opposition upon the circumference of a stack under the influence of tension maintained by steel cables encompassing the stack, extending

between the diametrically opposite vehicles to a pair of idler bogies also in diametrical opposition and spaced from the



vehicles so that the cables are at all times spaced from the stack.

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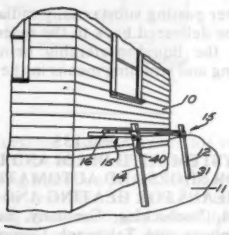
3,586,128

## SCAFFOLDING DEVICE

Robert Eugene Sandberg, Peck Hill Road, Johnston, R.I.

Filed Aug. 6, 1969, Ser. No. 847,850
Int. Cl. E04g 1/04
U.S. Cl. 182—229 3 Claims



A device to form a staging on a base such as the ground comprising a single upright support, a looplike member to embrace said upright support with arms on said member extending generally horizontally laterally from the upright support for engagement with a wall of a building to provide between the upright support and the building a rest for the formation of a platform.

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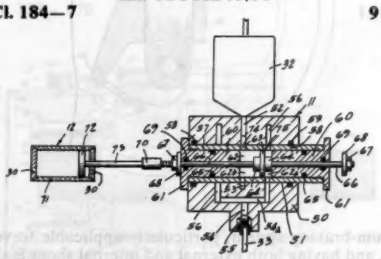
3,586,129

## METERING DEVICE

Richard Cass, Birmingham, Mich., assignor to THW Inc., Cleveland, Ohio

Filed July 7, 1969, Ser. No. 839,288
Int. Cl. F16n 13/16
U.S. Cl. 184—7 9 Claims



A fluid measuring device for automatically dispensing a fixed quantity of fluid such as grease to components such as ball joints for wheel suspension and steering linkages. The device includes a ported housing, a ported sleeve slidable in the housing, a double acting piston slidable in the sleeve, a single power source driving the piston, and stop for the sleeve and piston controlling relative movement thereof for effecting a metered discharge from the housing.

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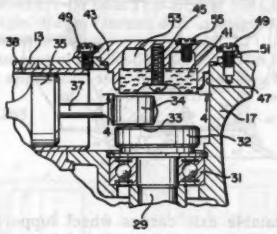
3,586,130

## LUBRICATION SYSTEM FOR RECIPROCATING TOOL

Leo A. McCafferty, Jr., and Daniel H. Sides, both of Baltimore, Md., assignors to The Black and Decker Manufacturing Company

Filed Oct. 1, 1969, Ser. No. 862,680
Int. Cl. F16n 39/00
U.S. Cl. 184—98 8 Claims



A portable power tool including a rigid housing and handle. A tool bit supported by the housing is adapted to be rotated and reciprocated by a motor within the housing. A novel lubrication system is provided to lubricate transmission parts within the housing which impart reciprocation to the tool bit from the motor. Lubrication is effected by a lowered viscosity of a lubricating oil, as the result of normal operating temperatures within the tool housing, and normal vibrations of the tool.

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## ERRATUM

For Class 187—029 see:
Patent No. 3,586,133

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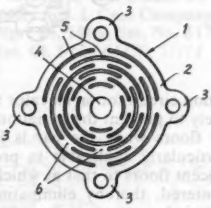
3,586,131

## PLASTIC DEFORMATION-ABSORBING DEVICES

Noel Le Mire, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Mar. 10, 1969, Ser. No. 805,634
Claims priority, application France, Mar. 13, 1968, 143568
Int. Cl. F16f 7/12
U.S. Cl. 188—1 2 Claims

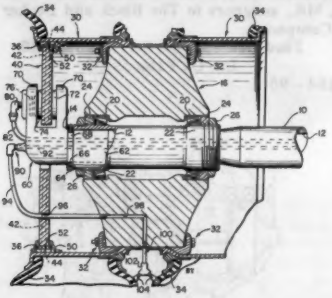


Mechanical energy absorbing device permitting absorbing a thrust by the plastic deformation of a member, characterized in that it comprises a metal plate having a central fastening point and a plurality of lateral-fastening points, said metal plate being so apertured that it can expand when subjected to a certain effort tending to move said central fastening point away from at least one of said lateral-fastening points.

## 3,586,132
## OUTBOARD MOUNTED BRAKE

Keith W. Tantlinger, Grosse Pointe Shores, Mich., assignor to Fruehauf Corporation, Detroit, Mich.

Filed May 22, 1969, Ser. No. 826,891
Int. Cl. B60t *1/06*; F16d *55/224*
U.S. Cl. 188—18 A 2 Claims



A nonrotatable axle carries wheel support means upon which a wheel is rotatably journaled. A brake disc is drivingly connected with the wheel for rotation therewith. A caliper means engageable with said brake disc is connected with the axle means and held against rotation with respect thereto. Both the brake disc and the caliper means are disposed outboard of the wheel support means.

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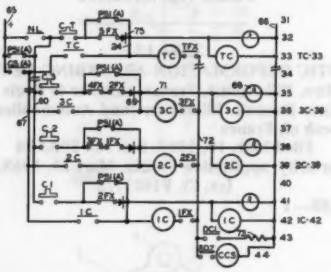
## 3,586,133
## ELEVATOR CONTROL HAVING RESTRICTED SERVICE

Jerome Santysiak, Toledo, Ohio, assignor to Reliance Electric Company, Euclid, Ohio

Filed Apr. 25, 1969, Ser. No. 819,215
Int. Cl. B66b *1/20*
U.S. Cl. 187—29 11 Claims



A call registration circuit for an elevator which can be conditioned selectively to prevent the initiation of registration of calls for certain floors while the car is located at certain other floors. Particularly applicable to preventing car calls for the next adjacent floors to that at which the call registering passenger entered, thereby eliminating one floor runs during selected periods.

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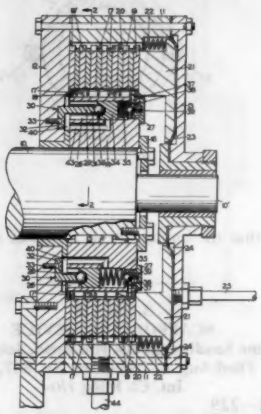
## 3,586,134
## COOLING LIQUID CIRCULATING SYSTEM FOR DISC BRAKE

Paul J. Westfall, 2340 N.W. Nicolai St., Portland, Oreg.

Filed July 16, 1969, Ser. No. 842,237
Int. Cl. F16d *65/84*
U.S. Cl. 188—71.6 1 Claim

The rotation of the wheel assembly to which the disc brake is applied causes spring-controlled plungers in a plurality of force pumps to be operated through engagement with cam means, the rotation of the wheel providing relative rotational movement of the plungers with respect to the cam means; the operation of the plungers in the pumps causing cooling liquid to be drawn from a reservoir and delivered to the friction discs, then after passing substantially radially outwardly over the discs, to be delivered back to the reservoir for continued recirculation; the liquid preferably being caused to pass through cooling and straining means in the course of its recirculation.



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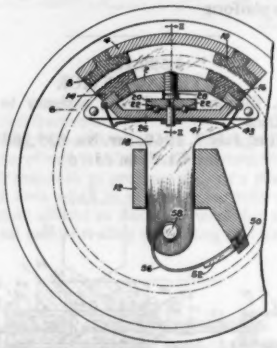
## 3,586,135
## BRAKE SYSTEM WITH DRUM AND INTERIOR AND EXTERIOR SHOES AND AUTOMATIC ADJUSTING MEANS FOR HEATING AND WEAR

Fritz Ostwald, Buchschlag, Germany, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 5, 1969, Ser. No. 821,853
Claims priority, application Germany, May 6, 1968, P 17 50 478.8
Int. Cl. F16d *53/00*
U.S. Cl. 188—76 8 Claims



A drum-braking system, particularly applicable to vehicular use, and having both external and internal shoes is shown. A carrier assembly on which actuators for both shoes are mounted, is itself mounted with a small amount of radial translational freedom with respect to an axle or steering knuckle. Movement within that freedom is controlled by a bimetal strip which is placed so as to be heated by the drum. A spring loop connects the bimetal strip to the carrier and acts to restore the external shoe clearance after drum cool-

ing; the heating action having acted to adapt the external shoe clearance to heat induced drum distortion. The characteristics of the spring loop are such that the spring will deform partially plastically when its deflection is relatively great during heating because the brake linings have been allowed to wear beyond a predetermined amount. Thus adjustment for lining wear is combined in the structure for adjusting to heat-induced temporary drum distortions.

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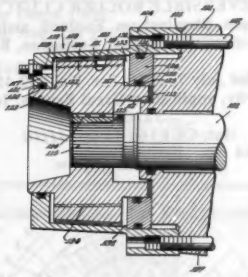
**3,586,136**
**HYDRAULICALLY RELEASABLE LOCKING BRAKES FOR ROTARY DEVICES**
**Gordon W. Kamman, Buffalo, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.**
**Filed Sept. 12, 1969, Ser. No. 857,426**
**Int. Cl. F16d** *65/24*
**U.S. Cl. 188—170** **10 Claims**



Hydraulically releasable locking brakes for rotary devices include a brake drum for attachment rigidly to a body which journals a shaft having a portion projecting therefrom and on which is corotatively mounted an annular brakeshoe, the shoe and drum having complementary normally lockingly engaged frustoconical braking surfaces of largest diameter near the body, with the braking surface of the shoe comprising high friction brake material bonded to the shoe. The brakeshoe is normally thrust axially to effect locking frictional engagement of the braking surfaces. Rotary seals are provided at substantially smaller diameter opposite end portions of the brakeshoe than the braking surface diameter and free from increased clearances when the drum is expanded by hydraulic unlocking pressure.

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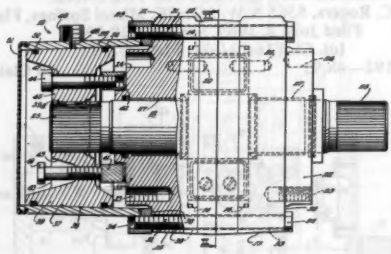
**3,586,137**
**HYDRAULICALLY RELEASABLE LOCKING BRAKES FOR ROTARY DEVICES**
**Gordon W. Kamman, Buffalo, N.Y., assignor to Heudaille Industries, Inc., Buffalo, N.Y.**
**Filed May 5, 1969, Ser. No. 821,645**
**Int. Cl. F16d** *65/24*
**U.S. Cl. 188—170** **14 Claims**



A hydraulically releasable locking brake for rotary devices includes a brakedrum for attachment rigidly to a body which journals a shaft having a portion projecting therefrom and on which is corotatively mounted an annular brakeshoe, the shoe and drum having complementary normally lockingly engaged frustoconical braking surfaces of largest diameter near the body, means on the brakeshoe thrusting toward and against the body to effect normal locking frictional engagement of the braking surfaces and including bearing means enabling relative rotary movement between the brakeshoe and the body, and means for selectively hydraulically unlocking the braking surfaces to enable relative rotation of the shaft and body. Adjustment in the locking braking static holding torque may be effected by adjusting the brakeshoe relative to the brakedrum or by adjusting the brakedrum relative to the brakeshoe.

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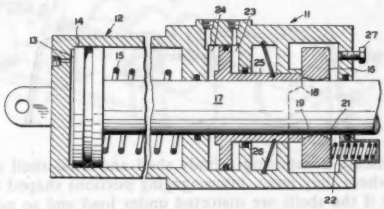
**3,586,138**
**HYDRAULICALLY OPERATED LOCK MECHANISMS**
**Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation**
**Continuation-in-part of application Ser. No. 726,766, May 6, 1968. This application Dec. 5, 1969, Ser. No. 882,655**
**Int. Cl. B60t** *17/16*
**U.S. Cl. 188—265** **15 Claims**



Fluid pressure operated lock mechanism for reciprocating elements particularly suited for use with hydraulic brake cylinders on railway cars. The lock mechanism includes a lock which is biased toward lock position and is yieldingly held in both the lock and unlock positions by a detent. One fluid pressure motor overpowers the detent and allows the biasing spring to move the lock into locking position, and another such motor overpowers the detent and moves the lock to unlock position. The lock itself may be a canting ring adapted to grip the reciprocating element, or a circumferential series of rollers which can be wedged selectively between that element and a camming surface, or a similar group of rollers which act to force the sliding element into engagement with a friction shoe. In the last mentioned versions, the rollers may be moved out of wedging engagement simultaneously, or they may be unlocked sequentially in groups or individually.

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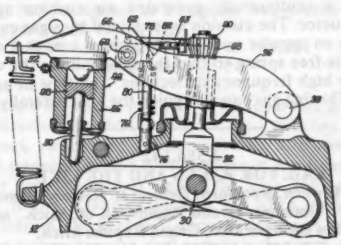
**3,586,139**
**SELF-ADJUSTING BRAKE MECHANISM**
**Peter D. Ruffalo, Kenosha, and Jerald D. Hinke, Rancine, both, Wis., assignors to J. I. Case Company**
**Filed Apr. 18, 1969, Ser. No. 817,425**
**Int. Cl. F16d** *65/56, 55/14*
**U.S. Cl. 188—196** **14 Claims**



An automatic adjuster for adjusting the running clearance between brake elements which are actuated by a pivoted arm

operatively connected to one of the brake elements by a rod. The adjuster includes a bellcrank pivoted on the arm and carrying an actuator element having a free end in engagement with ratchet teeth on a nut threaded onto the rod with the nut frictionally engaging the arm. A tension spring pivots the bellcrank when the frictional forces between the nut and arm are below a predetermined level to rotate the nut thereby adjusting the running clearance. The adjuster further includes a return bar engaging the bellcrank to return the bellcrank to its normal position upon return of the pivoted arm to its normal inoperative position.

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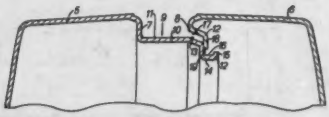
**3,586,140**
**TRAVEL CASES**

**Richard Edward Kellett, Whitefield, Manchester, and Kenneth Carl, Bamford, Rochdale, both of, England, assignors to Antler Limited, Bury, Lancashire, England**

**Filed Mar. 21, 1969, Ser. No. 809,212**
**Claims priority, application Great Britain, Mar. 26, 1968, Mar. 26, 1968, 14423;14424**
**Int. Cl. A45c** *5/00*
**U.S. Cl. 190—41** **10 Claims**



A suitcase comprising a body shell and a lid shell which have, where they meet, interengaging portions shaped to interlock if the shells are distorted under load and so prevent separation of the shells. The shells may be mouldings with integral hinge leaves and assembled by inserting a hinge pin through the leaves.

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**3,586,141**
**ELECTRIC PICK-UP DEVICE**

**Dennis Hennessey, London, and William Barrie Hart, Southhampton, both of, England, assignors to Tracked Hoovercraft Limited, London, England**

**Filed May 19, 1969, Ser. No. 825,803**
**Claims priority, application Great Britain, Mar. 20, 1968, 23,964**
**Int. Cl. B60l** *5/08*
**U.S. Cl. 191—45** **12 Claims**

An electrical pickup device particularly for a high-speed electrically propelled vehicle, consists of a shoe which is biased by a continuously generated air cushion against a fixed conductor. The cushion is contained by a gas curtain issuing from an annular nozzle. The cushion acts as a substantially inertia-free spring so that the shoe follows the conductor despite high frequency deflections. The flow of gas cools the shoe. Flowing gas can also guide the shoe laterally.

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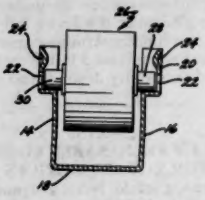
**3,586,142**
**RAIL FOR RACKS AND THE LIKE**

**Russell A. Inwood, Rockford; Delbert L. Rector, Belmont, and James R. Timmons, Grand Rapids, all of, Mich., assignors to Rapistan Incorporated, Grand Rapids, Mich.**

**Filed May 1, 1969, Ser. No. 820,833**
**Int. Cl. B65g** *13/00*
**U.S. Cl. 193—35** **3 Claims**

This disclosure relates to a rail for lightweight storage and the like. The rail has a plurality of axle containing rollers or wheels removably fixed in a U-shaped support through sockets formed in the sides of the support. Indented portions



of the sockets provide a snap-fit engagement for removably securing each individual wheel within its socket.

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**3,586,143**
**REVERSIBLE ROLLER CLUTCH**

**Phillip Hutchinson, Birmingham, England, assignor to G.K.N. Birfield Transmissions Limited, Erdington, Birmington, England**

**Filed July 7, 1969, Ser. No. 839,459**
**Claims priority, application Great Britain, July 5, 1968, 32107/68**
**Int. Cl. F16d** *41/06, 41/10*
**U.S. Cl. 192—44** **8 Claims**

A clutch comprising inner and outer clutch members between which is disposed a pair of rolling members each of which is urged to a wedging position in which it prevents relative displacement or rotation of the clutch members in a corresponding one of the two possible directions of relative rotation, but allows relative rotation in the other of such direction, and means operative to displace one or other of the rolling members from its respective wedging position whereby the clutch is freed for relative displacement or rotation of the clutch members in one or other of said directions.

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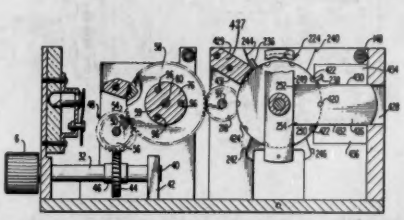
**3,586,144**
**MECHANICAL MOVEMENT AND CONTROL MECHANISM EMPLOYING THE SAME**

**William C. Rogers, 5365 N.W. 36th St., Miami Springs, Fla.**

**Filed June 2, 1969, Ser. No. 829,594**
**Int. Cl. F16d** *21/04;* **F16h** *35/18*
**U.S. Cl. 192—48.91** **15 Claims**



A mechanical movement for controlling two rotary outputs from a single rotary input to which both outputs are slip

clutched. One output is normally latched while the second output rotates in response to rotation of the input. At a first predetermined point the second output is latched against rotation in one direction and the first output is permitted to rotate in that direction in response to input rotation. Reversal of the angular direction of input rotation results in the locking of the first output while the second output is permitted to rotate in the reverse direction to a second predetermined point at which the second output is again latched and the first output is again freed for rotation in the reverse direction The outputs may be used to position tapes provided with both visible indicia and a machine readable indicia so that both visual indication of the output position and control of an appropriate switching mechanism may be obtained.

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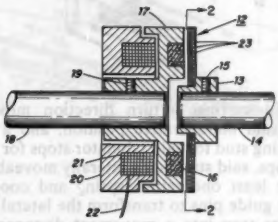
**3,586,145**
**ELECTROMAGNETIC CLUTCH HAVING STACKED ARMATURE DISKS**

**Omar Leo Cunningham, Jr., La Jolla, and Howard N. Saxton, El Cajon, both of, Calif., assignors to Stromberg Datagraphix, Inc., San Diego, Calif.**

**Filed Aug. 28, 1969, Ser. No. 853,785**
**Int. Cl. F16d *27/10***
**U.S. Cl. 192—84C** **5 Claims**



A method to substantially eliminate audible noise in electromagnetic shaft coupling devices is disclosed which utilizes an armature assembly comprising a plurality of thin armature discs which lower the resonant frequency, provide frictional damping, and make the armature discs sufficiently flexible to conform to the mating surface.

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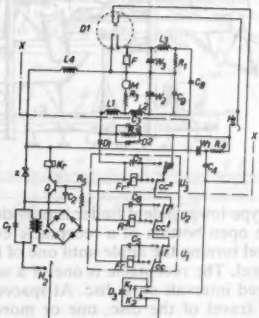
**3,586,146**
**COIN OPERATED APPARATUS AND SIGNALLING SYSTEM**

**Edmond Marie Heirbaut, Melsele-Wars; Raymond Franics Adrian Fabre, Wilrijk; Josephus Camps, Edegem; Karel Henricus, Edegem, and Michael Marcel Mees, Londerzeel, all of, Belgium, assignors to International Standard Electric Corporation**

**Division of Ser. No. 602,096, Dec. 15, 1966, filed May 26, 1969, Ser. No. 844,701**
**Int. Cl. G07f *9/02***
**U.S. Cl. 194—16** **2 Claims**



A coin mechanism for producing one or more pulses responsive to a coin having been received into the mechanism. The number of pulses is representative of the value of the coin received. Coins of different values are channelled into different paths, each path holding its coin for a sufficiently long period of time to allow the correct number of value indicating pulses to be transmitted.

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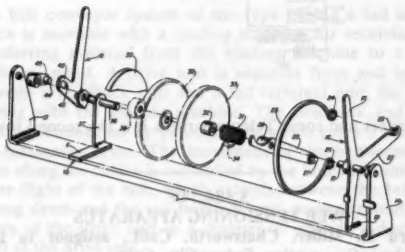
**3,586,147**
**DECELERATING MECHANISM**

**Wayne C. Hoffman, Glastonbury, Conn., assignor to Litton Business Systems, Inc.**

**Filed Mar. 31, 1967, Ser. No. 627,384**
**Int. Cl. B41j *19/02***
**U.S. Cl. 197—64** **2 Claims**



Mechanism for decelerating a moving mass during a predetermined terminal portion of its travel in advance of a final stop whereby it is arrested with a minimum of shock. The mechanism duplicates the velocity sensitive energy absorbing qualities of a pneumatic dashpot. In accordance with the invention the kinetic energy of the moving mass is transferred to a spring which in turn applies the energy stored therein to accelerate a movable mass which dissipates the energy in the form of heat. A specific application is as an energy absorbing system for a typewriter carriage wherein carriage motion is resisted by a shock absorbing spring which applies torque to drive a rotatable mass in the form of a flywheel thus reducing the speed of the carriage in advance of a final stop to enable escapement mechanism to regain control of the carriage at the final carriage position, the energy of the carriage thereafter being dissipated by friction of the rotating mass.

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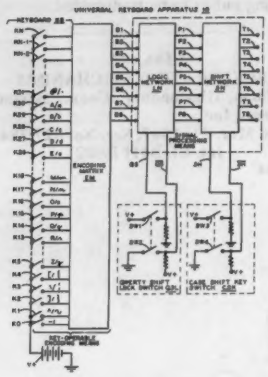
**3,586,148**
**KEYBOARD APPARATUS SWITCHABLE BETWEEN TELETYPE AND TYPEWRITER OPERATION**

**Allen G. Jacobson, Ramsey, and Theodore Schieber, Wayne, both of, N.J., assignors to Computer Transceiver Systems Inc., Upper Saddle River, N.J.**

**Filed Aug. 6, 1968, Ser. No. 750,551**
**Int. Cl. B41j *25/24***
**U.S. Cl. 197—71** **2 Claims**

A keyboard includes a plurality of key-operated graphic indicia (characters, symbols, numerics, etc.) switches, a Qwerty shift lock switch and a case shift switch. Normally, the keyboard transmits coded combinations of signals representing lower case characters unless the case shift switch is operated. In the "Qwerty" position, i.e. when the shift lock switch is thrown, the keyboard normally transmits upper case characters unless the case shift switch is operated. In either event, certain symbols are transmitted according to the normal operation, i.e. the "Qwerty" shift switch does not effect the normal transmission of symbols. A Qwerty field on a

keyboard is that row of keys associated with the characters Q, W, E, R, T, Y, U, I, O, P. On conventional office



typewriters and some Teletypewriters it is the second row of keys.

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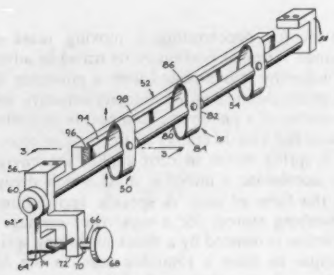
**3,586,149**

**WEB TENSIONING APPARATUS**

**Richard H. Miller, Chatsworth, Calif., assignor to Data Products Corporation, Culver City, Calif.**

**Filed Feb. 7, 1969, Ser. No. 797,640**
**Int. Cl. B41j 15/00**
**U.S. Cl. 197—133 R** **10 Claims**



Apparatus useful in a high speed printing device for automatically tensioning the paper to assure smooth and even movement. Edge perforated paper is employed which is pulled by a tractor drive mechanism from a fan folded supply stack through the automatic tensioning means and past a printing hammer bank. The automatic tensioning means is comprised of a series of elliptical springs mounted on rotatable adjuster rod adjacent one side of the paper and a backup bar having the same surface characteristics as the springs mounted on a resilient pad adjacent the other side of the paper.

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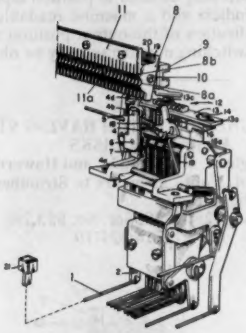
**3,586,150**

**TABULATOR SAFETY APPARATUS**

**Ivar Holtklint, Karlshamn, Sweden, assignor to Facit-Halda AB,, Svangsta, Sweden**

**Filed Oct. 31, 1968, Ser. No. 772,349**
**Claims priority, application Sweden, Nov. 2, 1967, 15037/67**
**Int. Cl. B41j 21/04**
**U.S. Cl. 197—179** **1 Claim**

A tabulator safety apparatus for use with typewriters, calculating machines, accounting machines or the like having a movable motor operated carriage, to prevent the movable carriage from being halted when the tabulator set key is depressed during carriage travel or when the tabulator key is depressed during the return travel of the carriage including a holder having at least one tabulation stop member disposed therein or coacting with a tabulator stop in stopping position, said holder being movable against a spring in a carriage return direction, said stop member being movable between an position and a nonoperative position, a link mechanism cooperating with said holder and transferring said holder movement to said stop member whereby said holder move-



ment in said carriage return direction moves said stop member to said nonoperative position, and a swinging arc having a setting stud for said tabulator stops for engaging said tabulator stops, said stud being laterally moveable against the action of at least one return spring and cooperating with recesses and guide pins to transform the lateral movement of said tabulator stop into a movement disengaging said stud from said tabulator stop.

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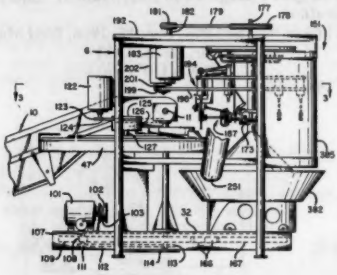
**3,586,151**

**DEVICE FOR ORIENTING APPLES**

**Malcolm W. Loveland, Orinda, and Robert G. Ellis, Richmond, both of, Calif., assignors to Atlas Pacific Engineering Company**

**Continuation-in-part of application Ser. No. 629,618, Apr. 10, 1967, now abandoned. This application Jan. 2, 1969, Ser. No. 814,477**
**Int. Cl. B65g 47/24**
**U.S. Cl. 198—33** **15 Claims**



A wheel-type lower indent finder is provided cooperatively adjacent the open bottom of a receptacle containing an apple, the wheel turning the apple until one of its two indents is over the wheel. The receptacle is one of a series provided at regular spaced intervals on a disc. At spaced intervals along the path of travel of the disc, one or more spring pressed devices are provided which serve to disturb a rotating or nonrotating unoriented apple and return it to a position in its receptacle in which the wheel can effectively turn the apple until the lower indent in the apple is over the wheel but is free of the wheel. Thereafter, the lower indent is engaged by

an indent pickup finger which is effective to engage the lower indent. Immediately thereafter an upper indent pickup finger is lowered to engage the upper indent. If the lower indent is engaged but the upper indent is not in exact vertical alignment, then the upper indent pickup finger assists positively in actually shifting the fruit so that the upper finger will engage the upper indent. The indent engaging means are thereafter effective to move an apple held between them to a desired location. If both indents are not engaged by the finers, the fruit is rejected.

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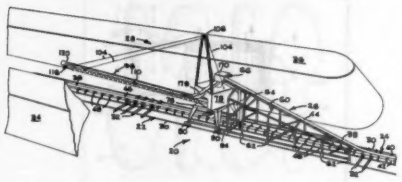
**3,586,152**
**STACKING AND UNSTACKING MAGNETIZABLE MATERIAL**

**George E. Austin, Mercer Island, and Robert H. Shannon, Seattle, both of, Wash., assignors to FMC Corporation, San Jose, Calif.**

**Filed Feb. 24, 1969, Ser. No. 801,592**
**Int. Cl. B65g** *65/28*
**U.S. Cl. 198—36** **4 Claims**



A stacking and unstacking apparatus movable along a transport conveyor transfers incoming scrap to a belt conveyor mounted on a swingable boom for discharge into large stockpiles on either side along the transport conveyor. A magnetic pulley on the outer end of the boom attracts the scrap from the stockpile to the boom belt conveyor during unstacking. Transfer chuting is employed to direct the incoming scrap to the boom conveyor during stacking and receives scrap from the boom conveyor during unstacking. The chuting is also employed to combine the incoming scrap with the scrap being unstacked and deposits the combined scrap on the transfer conveyor for movement to a loading area.

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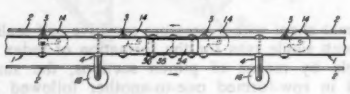
**3,586,153**
**CONVEYOR SYSTEMS**

**George Henry Rainbow, Gerrards, Cross, England, assignor to The Metal Box Company Limited, London, England**

**Filed Mar. 10, 1969, Ser. No. 805,596**
**Claims priority, application Great Britain, Mar. 12, 1968, 12,052/68**
**Int. Cl. B61b** *11/00*
**U.S. Cl. 198—130** **11 Claims**

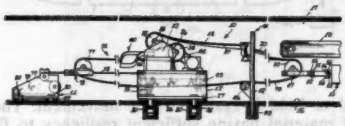


This disclosure has to do with a conveyor system particularly adapted for conveying cans and bottles which is of a construction wherein it may be readily assembled and installed in the desired position accurately with a minimum of drilling and fitting.

**3,586,154**
**EXTENSIBLE CONVEYOR**

**William G. Schultz, Rocanville, Saskatchewan, Canada, assignor to Hudson Bay Mining and Smelting Co., Toronto-Dominion Centre, Toronto, Ontario, Canada, a part interest**

**Filed Oct. 13, 1969, Ser. No. 869,444**
**Claims priority, application Canada, Jan. 16, 1969, 040,318**
**Int. Cl. B65g** *15/00*
**U.S. Cl. 198—139** **12 Claims**



A belt conveyor system of the type having a tail section which is movable with a loading machine for receiving and transferring material from the loading machine to a fixed discharge point. A drive unit is separate from and located between a holdback unit and a tail terminal unit, the latter moving with the loading machine. The holdback and drive units are connected by guide cables which carry a movable belt-tensioning drum. The movement of the belt-tensioning drum along the cables is controlled by the holdback unit. The upper flight of the belt, which extends between the belt-tensioning drum and the tail terminal unit, passes around drive drums of the drive unit in a manner to provide a discharge point at the drive unit.

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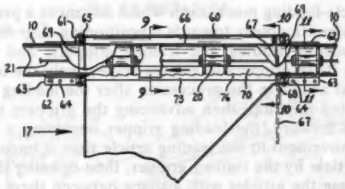
**3,586,155**
**TUBULAR CONVEYOR WITH SPOOL-SHAPED CONVEYOR FLIGHTS**

**Fred C. Turrentine, Milwaukie, and James K. Wriglesworth, Portland, both of, Oreg., assignors to Con-Vey International, Inc., Portland, Oreg.**

**Filed Apr. 25, 1969, Ser. No. 819,349**
**Int. Cl. B65g** *19/08*
**U.S. Cl. 198—172** **10 Claims**



Spool-shaped conveyor flights are pulled through a tube by an endless cable driven by a sprocket wheel. A plurality of sections of cable equipped with drive lugs and coupling lugs is connected together end to end. The spools have interior cavities to contain such lugs, certain spools serving as couplings for connecting together the ends of adjacent sections of cable. The spools are split longitudinally for convenience in mounting on and removal from the cable. This arrangement permits the tube to bend in any direction whereby it is not constrained to a single plane of operation.

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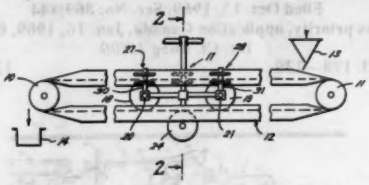
**3,586,156**
**CONVEYOR AND TAPE THEREFOR**

**Othel D. Easley, Jr., 2425 Sage Road, Apt. 218, Houston, Tex.**

**Filed July 10, 1969, Ser. No. 840,701**
**Int. Cl. B65g** *15/40*
**U.S. Cl. 198—201** **27 Claims**

The conveyor disclosed includes rollers and an endless tape that encircles the rollers and is moved longitudinally by rotation of one of the rollers. The tape is preformed into a

troughlike shape in cross section with at least two sections of the strip curved in opposite directions to provide a guide surface. Guide rollers engage the guide surface to support the



tape and to hold it against lateral movement. The tape is made of material having sufficient resiliency to flatten, as required, when the tape changes its direction of travel, and thereafter to return to its preformed shape.

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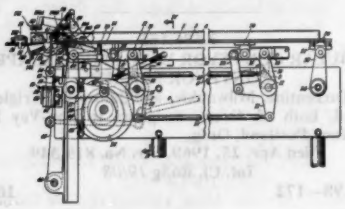
**3,586,157**
**WRAPPING MACHINES**
**Matthew Parker, Leeds, and Edwin Hall Lazenby, Bardsey, near Leeds, both of, England, assignors to Rose Forgrove Limited, Leeds, England**
**Filed Feb. 4, 1969, Ser. No. 796,375**
**Claims priority, application Great Britain, Feb. 6, 1968, 5835/68**
**Int. Cl. B65g *25/04***
**U.S. Cl. 198—218** **5 Claims**



Article-feeding mechanism which advances a procession of articles continuously towards a positioning stop and includes reciprocating leading and trailing grippers, and means for closing these grippers to engage respectively the leading and the next article in the procession after the leading article has contacted the stop, then advancing the grippers to feed the articles forward, the leading gripper imparting a larger forward movement to the leading article than is imparted to the next article by the trailing gripper, then opening the grippers to release the articles with a space between them and finally returning the grippers.

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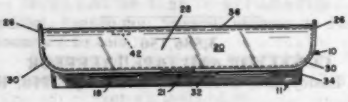
**3,586,158**
**HINGELESS RAZOR CASE**
**Ralph A. Muscatiello, Norwood, Mass., assignor to The Gillette Company, Boston, Mass.**
**Filed Jan. 2, 1969, Ser. No. 788,506**
**Int. Cl. B65d *85/54***
**U.S. Cl. 206—16** **1 Claim**



A safety razor case comprising a base tray and cover; the base tray having upwardly extending end walls but no sidewalls, an underlying pedestal for holding the bottom of the tray above a supporting surface, and an upwardly open recess which is contoured to receive and hold a razor. The cover is channel shaped with open ends and downwardly directed sidewalls; the lower edge of each sidewall being provided with a downwardly directed notched tongue for interlocking engagement with registered apertures in the tray, wherein said notched tongues are of different sizes so as not to be interchangeably insertable within the apertures. Thus, the cover can only be joined to the base when the corresponding tongues and apertures are aligned and the stop positioned on the underside of the cover is positioned so as to overlie the head of the safety razor.

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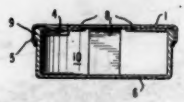
**3,586,159**
**ROUND CONTAINER WITH CLOSEABLE SINGLE-PIECE-WITHDRAWAL OPENING**
**Wilhelm Kirchner, Nurnberg, and Hans Umbach, Stadeln, Both of, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany**
**Filed May 27, 1969, Ser. No. 828,315**
**Claims priority, application Germany, May 29, 1968, G6,600,658**
**Int. Cl. B65d *83/04***
**U.S. Cl. 206—42** **6 Claims**



A container for the withdrawal of individual small articles which includes a bottom with a lid having an opening adapted to be closed and adapted to rotate relative to the bottom; the latter has lobes for sealing the opening from the inside of the container and is made of synthetic material while the lid is metallic; successively engaging flangelike beads or thickened portions which project toward the outside or inside of the bottom or lid, respectively, establish the rotatable connection.

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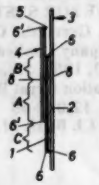
**3,586,160**
**FORMAT SHEET WITH SELF-SEALING LAYER FOR THE FORMATION OF INDEX TABS**
**Heimann, Egon, Falkenberg 67, 56 Wuppertal-Elberfeld, Germany**
**Filed Jan. 30, 1969, Ser. No. 795,298**
**Int. Cl. B65d *83/00***
**U.S. Cl. 206—56AB** **2 Claims**



A format sheet with a pressure-sensitive self-sealing layer from which single tabs for the formation of index tabs are removable by means of punch sections, the single tabs disposed in row-formed one-to-another followed position, comprising a nonripped, protective sheet, a sealing layer side of the format sheet covered up with the nonripped protective sheet, the latter adhering to the former and easily releasable therefrom. The format sheet being covered by the nonripped protective sheet and comprises precut tabs, which have a fold line and a tab section forming a writing surface which is adapted to be foldable over the fold line after the precut tab is removed from the protective sheet. A clear view foil is disposed on the upper side of the format sheet, and having a

self-sealing layer, the clear view foil being precut to individual cover sheets for each of the precut tabs. The precut tab is cut at a head-sided separating cut and a foot-sided separating cut and including adjacent the head-sided separating cut a foldable section which is sealing material repelling and foldable about the fold line, the latter of which constitutes perforations. The clear view foil projects beyond the foldable section, and the clear view foil being held back in corresponding staggering disposition relative to the foot-sided separating cut.

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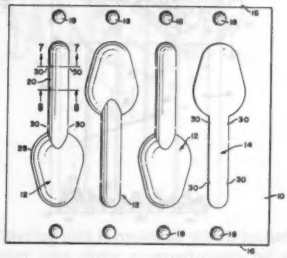
**3,586,161**

## CUTLERY CLUSTER

**Gim P. Fong, Auburndale, and Paul Davis, Swampscott, both of, Mass., assignors to Sweetheart Plastics, Inc., Wilmington, Mass.**

**Filed July 10, 1969, Ser. No. 840,699**
**Int. Cl. B65d** *83/00*
**U.S. Cl. 206—56AB** **7 Claims**



A cluster of cutlery formed in a sheet with each of the several items of cutlery having its handle severably joined by tabs to the sheet while the remaining portion of each cutlery item is completely severed from the sheet. Each cutlery item may be separated from the sheet without separating the other items.

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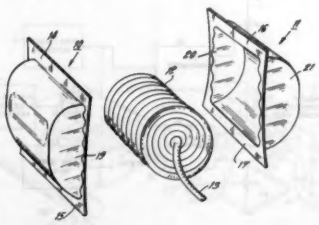
**3,586,162**

## DISPENSING CONTAINER FOR YARN AND THE LIKE

**Richard A. Townsend, Rockaway, N.J., assignor to Sun Chemical Corporation, New York, N.Y.**

**Filed June 5, 1969, Ser. No. 830,604**
**Int. Cl. B65h** *55/00*
**U.S. Cl. 206—64** **10 Claims**



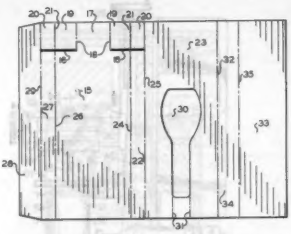
Two semicylindrical hollow plastic sections are sealed to one another along adjacent flanges of a pair of opposite sides. The other two sides abut one another along their edges to define a dustproof enclosure. The abutting edges can open by squeezing the container to gain access to the end of a ball of yarn in the interior of the container.

**3,586,163**

## BICYCLE LOCK AND KEY PACKAGE

**Karl K. Loehrer, Cedarburg, and Daniel J. Foote, Wauwatosa, both of, Wis., assignors to Master Lock Company, Milwaukee, Wis.**

**Filed June 3, 1969, Ser. No. 830,025**
**Int. Cl. B65d** *81/00, 85/00*
**U.S. Cl. 206—80R** **6 Claims**



A display type of sleeve envelopes the major portion of the elongated shackle of a bicycle padlock or the like and retains in the sleeve against removal by a tamperer a "bubble" like key enclosure. The padlock body applied externally to the protruding inner ends of the shackle legs closes the bottom of the sleeve and prevents movement of the padlock assemblage in one direction, while the closed end of the shackle bridges walls or shoulders at the top of the sleeve to prevent withdrawal movement of the shackle from the sleeve in another direction. The sleeve containing the padlock assemblage for shipping and customer inspection at a dealer's, renders the product visible.

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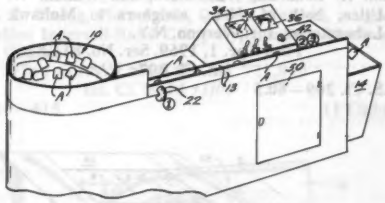
**3,586,164**

## HARDNESS DETECTOR AND ARTICLE SELECTING DEVICE

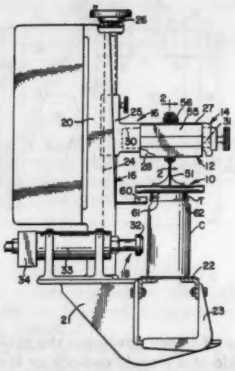
**James L. Pool, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa**

**Filed Jan. 21, 1969, Ser. No. 792,270**
**Int. Cl. B07c** *5/34*
**U.S. Cl. 209—73** **2 Claims**



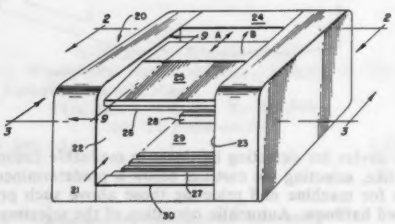
A device for detecting hardness in malleable castings and the like, selecting the castings below a predetermined hardness for machine and rejecting those above such predetermined hardness. Automatic operation of the selecting means is effected by conveying spaced articles past a magnetizing means where they are magnetized, then past a magnetism-sensing means after a predetermined time period so that the sensing means senses residual magnetism in the articles, the output of the sensing means operating a magnetism evaluating means which is adjusted for operating an article selecting device above a predetermined adjusted threshold to remove the rejected article from the conveyor, whereas those articles with a hardness below the threshold value remain on the conveyor as acceptable for machining purposes.

3,586,165
DUD DETECTOR
Henry J. Keinanen, Hickory Hills, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Jan. 10, 1969, Ser. No. 790,275
Int. Cl. B07c 3/10
U.S. Cl. 209—80 8 Claims



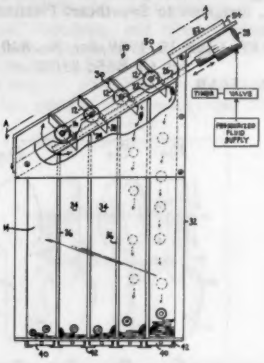
An apparatus for determining the condition of a top panel of a container or of a closure lid on a vacuum-packed container which indicates the vacuum or pressure condition within the container. The apparatus comprises a sensing head mounted at a detecting station for vertical reciprocation when a container is in proper position at the station which comprises a tubular housing resiliently supported in a horizontal position and enclosing a switch having an actuator intermediate the ends of the housing. The switch actuator is adapted to be operated when the housing is lowered into contact with oppositely disposed rim portions of the top panel or closure lid if the center of the panel is convex or raised, as a result of a loss of vacuum within the container. The switch controls an ejector device for removing from the detecting station a container having its top panel convex due to loss of vacuum.

3,586,166
CARD-SORTING METHOD AND APPARATUS
John H. Lanahan, Whitesboro, and William W. Abraham, Utica, both of, N.Y., assignors to Mohawk Industrial Laboratories, Inc., Vernon, N.Y.
Filed Apr. 1, 1969, Ser. No. 811,826
Int. Cl. B07c 3/18
U.S. Cl. 209—80.5 58 Claims



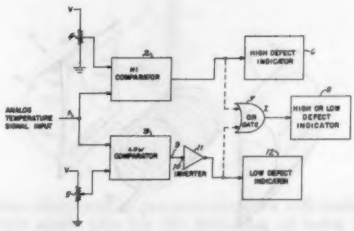
A selected group of edge-notched cards, to be removed from other cards of a stack, are moved downwardly onto selector bars relative to the other cards, preferably with the assistance of a physically engaging device such as a brush. The other cards are then moved rearwardly, after which the selected cards are raised and moved forwardly for removal. The card-supporting and moving members may be operated by means connected to a common camshaft for proper sequential operation. A card punch mechanism may be operable with the selector bars for notching the cards.

3,586,167
AUTOMATIC SIZING SELECTOR
Walter H. Lehner, Lincoln, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed May 28, 1969, Ser. No. 828,528
Int. Cl. B07c 5/06
U.S. Cl. 209—93 10 Claims



An automatic sizing selector comprising a sloping series of size selector plates, means to automatically rotate said plates between a sizing position and an unloading position and collector means for segregating sized units according to desired size.

3,586,168
ELECTRONIC CAN REJECT SYSTEM
Sheldon Osheff, Chicago, and Carl A. Pesce, Oak Lawn, both of, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Nov. 10, 1969, Ser. No. 875,133
Int. Cl. B07c 5/346
U.S. Cl. 209—111.5 10 Claims



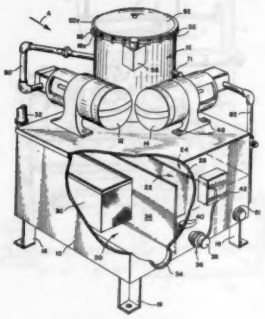
An electronic circuit for receiving the output of one or more detector units which may pick up the infrared emission from a welded seam as it passes by the detector unit or units. The circuit sorts out high and low signals to give an indication of hot or cold spots which indicate deficient welding. The signal is used to operate indicators, counters, and a weld reject mechanism or marking means.

3,586,169

## OIL-FILTERING UNIT

Duane Lucien Hultquist, Duluth, Minn., assignor to Duluth Filter Company, Duluth, Minn.

Filed Aug. 7, 1969, Ser. No. 848,303
Int. Cl. B01d 35/14, 35/18
U.S. Cl. 210—90 8 Claims



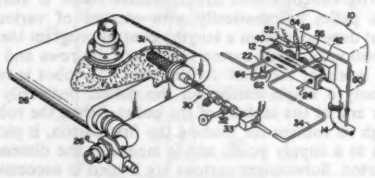
A compact filtering unit is provided which includes a reservoir tank divided into three compartments by a first and second spaced baffle plates. The first compartment includes a strainer basket for receiving oil to be filtered, oil from the first compartment, after passing through the strainer basket, flowing over the first baffle plate into the second compartment. Oil in the second compartment is pumped through a lower outlet to a filter tank mounted atop the reservoir tank, the filtered oil thence passing to the third compartment. The height of the second baffle plate is less than that of the first so that, upon obstruction of the filter tank, oil from the second compartment can flow over the second plate directly into the third compartment thereby bypassing the filter tank and eliminating any shortage of oil in the line.

3,586,170

## WASTE DISPOSAL SYSTEM AND BOILER

James Sims Reid, Hudson, Ohio, assignor to Standard Products Company, Cleveland, Ohio

Filed Dec. 4, 1968, Ser. No. 781,141
Int. Cl. B01d 21/00
U.S. Cl. 210—104 7 Claims



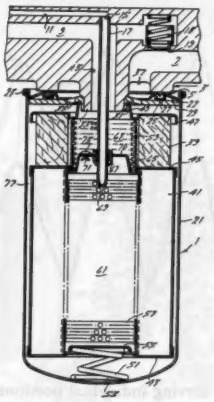
An improved waste disposal system in which a boiler unit is positioned between the block of an engine and the exhaust manifold with passages in the boiler unit through which the hot gases pass, thereby heating and vaporizing liquid waste material in the boiler.

3,586,171

## COMBINATION DUAL-FLOW AND TWO-STAGE FILTER

Robert J. Offer, Racine, Wis., assignor to Tenneco Inc., Houston, Tex.

Filed May 9, 1969, Ser. No. 823,327
Int. Cl. B01d 35/14, 27/10
U.S. Cl. 210—136 13 Claims



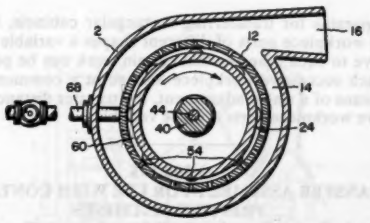
An oil filter for internal combustion engines has filter elements of two different flow rates arranged in parallel so that in general the high flow rate material acts as a full flow filter and filters oil going to the bearings and the low flow rate material acts as a bypass filter and filters oil that is returned to the crankcase. Automatic modification of this general dual-flow arrangement and control of flow through the low flow rate material is provided by orifice means that connects the outlet sides of the two filter elements. This means includes a hole that is controlled by a one-way valve which prevents flow from the high-flow outlet side to the low-flow outlet side but permits it in the reverse direction and may also include an open bleed hole.

3,586,172

## SCREENING APPARATUS

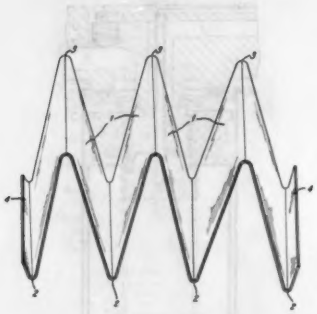
Douglas L. G. Young, Pierrefonds, Quebec, Canada, assignor to Canadian Ingersoll-Rand Company, Limited, Montreal, Quebec, Canada

Filed Apr. 16, 1968, Ser. No. 721,840
Int. Cl. B01d 33/02
U.S. Cl. 210—415 11 Claims



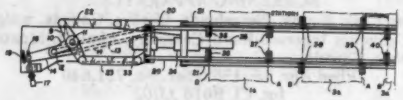

Pressure screening apparatus in which a rotor having a zoned pulse-generating wall member cooperates with a screen member provided with circumferential imperforate and perforate portions to control the velocity of the pulp flowing through the passage formed between the rotor wall member and the screen member, the screen member having a single dilution liquid opening in one of the imperforate portions thereof.

3,586,173
FOOD SERVICE
Wayne Alan Reynolds, 6229 Maloney Ave., Hopkins, Minn., assignor to The Taylor-Winfield Corporation, Warren, Ohio
Filed Feb. 26, 1969, Ser. No. 802,556
Int. Cl. A47g 29/00
U.S. Cl. 211—73 3 Claims



A method for serving individual portions of food by placing the servings in open containers such as paper bags and delivering these bags of food to the diner while maintaining them neat and securely upright so that the food will not spill from the open top. And a rack for use in such service having a plurality of pairs of successive, rigid supporting walls to keep the bags upright, and also provided with means for detachably connecting together a plurality of the racks.

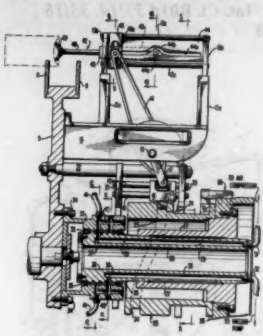
3,586,174
PARTS TRANSFER MECHANISM
Arthur M. Hall, Newton Falls, Ohio, assignor to The Taylor-Winfield Corporation, Warren, Ohio
Filed Sept. 25, 1969, Ser. No. 861,008
Int. Cl. B65g 25/04
U.S. Cl. 214—1 7 Claims



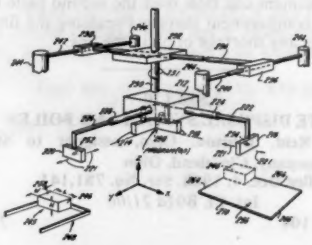
Apparatus for transferring rectangular cabinets, boxes or other workpiece parts of different shapes a variable distance relative to each other so that certain work can be performed on each successive workpiece located at a common station. By means of a single adjustment, the transfer distance of successive workpiece parts is made variable.

3,586,175
TRANSFER ASSEMBLY FOR USE WITH CONTAINER PRINTING MACHINES
James A. Gauld, Greenbrook, N.J., assignor to Sun Chemical Corporation, New York, N.Y.
Filed Nov. 15, 1968, Ser. No. 776,010
Int. Cl. B65g 47/24
U.S. Cl. 214—1 9 Claims

A transfer assembly for continuously removing printed cans from the mandrels of a container printing machine and placing the cans on a drying-oven conveyor positioned laterally of the mandrels, the transfer assembly including a plurality of pneumatically actuated can holders each of which are pivotally mounted on an oscillatory arm, whereby each can holder is pivoted through 180° to thereby remove a printed can from a mandrel and place the can on the drying-oven conveyor.



3,586,176
PALLETIZING APPARATUS
Michael I. Rackman, Brooklyn, N.Y., and George C. Devol, 990 Ridgefield Road, Wilton, Conn., said Rackman assignor to said Devol and Paul S. Martin, Flushing, N.Y.
Filed Apr. 9, 1969, Ser. No. 814,788
Int. Cl. B65g 57/20
U.S. Cl. 214—6 16 Claims



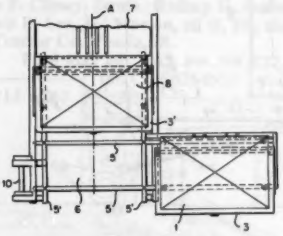
A program-controlled article-tranfer robot is adapted to load a pallet automatically with cartons of various sizes without dependence on a lengthy control program identifying the position of every carton in each of the rows and at each of the levels of the load. At the start, the robot is taught to load only a single carton on the pallet, ordinarily at one corner and at the surface of the pallet. When the robot goes through its routine for loading the first carton, it picks up a carton at a supply point, and it measures the dimensions of the carton. Subsequent cartons are loaded in successive rows and in successive levels automatically, in dependence on the first-carton loading coordinates, on the carton measurements, on the pallet size, and on the height limit of the load. The control apparatus prevents any projection of cartons outside the pallet outline and it also limits projection of cartons at upper levels beyond the next-lower level to within limits to insure stability.

The procedure is also operable to create a complete program automatically, so that subsequent robot operations can load and unload pallets under program control.

## 3,586,177
## PRESTACKING DEVICE FOR PRINTING PRESS SHEET FEEDING APPARATUS

Artur Buttner, Heidelberg, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed June 30, 1969, Ser. No. 837,960
Claims priority, application Germany, June 29, 1968, P 17 61 728.6
Int. Cl. B65g 57/00
U.S. Cl. 214—6 6 Claims

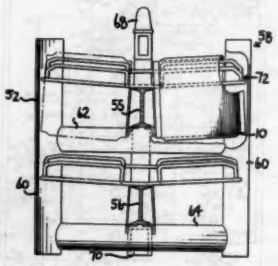


Sheet feeding apparatus for printing presses having a stacking table guide for guiding sheets prestacked on a stacking table to the sheet feeding apparatus is combined with a sheet prestacking device located adjacent a side of the stacking table guide, and swivel means located adjacent another side of the guide and formed with a pair of jaws defining a space therebetween wherein an empty stacking table is receivable from the guide, the swivel means being pivotable with an empty stacking table received in the space between the jaws to a position remote from the guide so as to free the guide for guiding a stacking table prestacked with sheets from the sheet prestacking device to an operative position adjacent the sheet feeding apparatus.

## 3,586,178
## HANDLING FIBER PACKAGES

George B. Zurheide, Upper St. Clair, and Frank E. Harvey, Pittsburgh, both of, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Original application Oct. 2, 1967, Ser. No. 672,211, now Division of Ser. No. 672,211, Oct. 2, 1967, Pat. No. 3,468,434.
Filed Mar. 6, 1969, Ser. No. 804,905
Int. Cl. B65g 1/20
U.S. Cl. 214—10.5 3 Claims

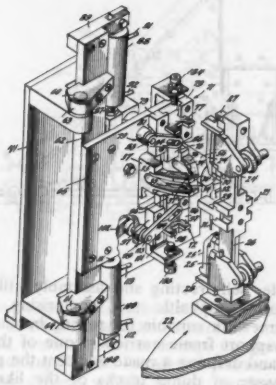


A crane movable along selected paths and with platforms is used to pull up storage racks on which are stored tubular fiber packages and to convey the racks to twist frames for loading with the packages. The platforms are movable vertically, adjustably and independently to positions for use of handling the packages from the storage rack to the twist frame spindles.

## 3,586,179
## APPARATUS FOR REMOVING AN ARTICLE CLAMPED IN A WORKHOLDER

Samuel Pinnolis, and Wilhelm E. A. Schmidt, both of Winston-Salem, N.C., assignors to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 620,318, Mar. 3, 1967, Pat. No. 3,491,900.
Filed Nov. 26, 1969, Ser. No. 877,573
Int. Cl. B65g 1/04
U.S. Cl. 214—16 B 4 Claims

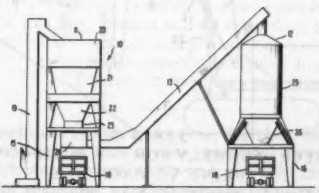


An apparatus opens clamping jaws on workholders mounted on a turret and then unloads articles held by resilient clamps on the workholder. A pair of open jaws are moved about an article held in a workholder and then closed while spring members bear against the article urging it against inner faces of the jaws. The jaws are withdrawn and opened to release the article into a bin which has a plurality of compartments and is indexed in synchronism with the turret so that articles removed from a particular workholder are always delivered to the same compartment of the receiving bin.

## 3,586,180
## DISPENSING AND CONVEYING APPARATUS FOR HOT MIX PLANT

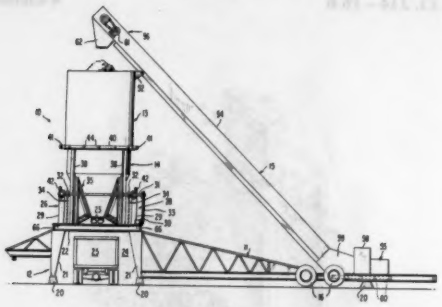
James D. Brock, Chattanooga, Tenn., assignor to CMI Corporation, Oklahoma City, Okla.

Filed May 2, 1969, Ser. No. 821,352
Int. Cl. B65g 65/42
U.S. Cl. 214—17 5 Claims



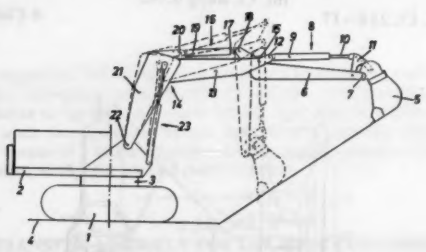
A dispensing and conveying apparatus for a hot mix plant of the type utilized to prepare and store hot asphalt mix which includes an elevated mix preparation plant, an elevated storage silo, and means for selectively dispensing hot mix directly from the mix preparation plant to a vehicle or for conveying the hot mix from the lower portion of the mix preparation plant to the upper portion of the storage silo.

3,586,181
PORTABLE SELF-ERECTING SILO
James D. Brock, Chattanooga, Tenn., assignor to CMI Cororation, Oklahoma City, Okla.
Filed June 9, 1969, Ser. No. 831,575
Int. Cl. B65g 67/08
U.S. Cl. 214—17 8 Claims



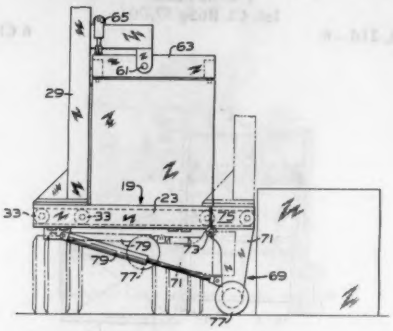
A portable, self-erecting silo assembly utilized for temporarily storing asphaltic mix comprising an elongated wheeled framework suitable for towing behind a motorized vehicle, a support frame carried at one of the ends of the framework and defining a space adjacent the ground surface for the passage of dump trucks or the like. A sectional telescoping container including a cylindrical outer element and a conical inner element is telescopically received in the support frame and movable from the space defined in the support frame in an upward direction to an expanded configuration generally above the space defined by the support frame. A drag chain conveyor is supported at one of its ends at the other end of the framework and has its delivery end connected to the cylindrical section of the container and is vertically movable with the container from a low profile or collapsed position to a high profile or operational condition.

3,586,182
BUCKET MOUNTING FOR TRENCH HOE
Friedrich Schwing, Rathausstr. 126, 468 Wanne-Eickel, Germany
Filed Apr. 17, 1969, Ser. No. 817,062
Claims priority, application Austria, Apr. 18, 1968, Mar. 31, 1969, A3806/68;A3176/69
Int. Cl. E02f 3/32
U.S. Cl. 214—138 1 Claim



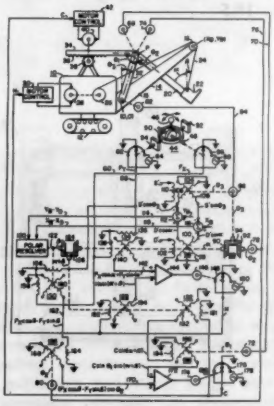
A trench hoe in which the dimension of a trapezoid control system or linkage comprising the digging bucket, the dipper arm, the front thrust piston drive, and the partial length of the ground outrigger arm between the dipper arm axis and the pivoting of the front thrust arm, in relation to the dimensions of the ground outrigger arm, that the dipper arm in operation at a desired angle of slope or gradient is guided approximately parallel within a predetermined range of angles or slope.

3,586,183
CONTAINER HANDLING VEHICLE
Walter M. Shaffer, Chesterland, Ohio, assignor to Towmotor Corporation, Cleveland, Ohio
Filed Mar. 25, 1969, Ser. No. 810,220
Int. Cl. B60p 1/54
U.S. Cl. 214—75G 8 Claims



A container handling vehicle which may utilize a lift truck chassis with (a) telescoping means allowing the container handling devices to move parallel to the longitudinal axis of the chassis, (b) channel means allowing the container handling devices to move vertically, and (c) channel and roller means for allowing the vertical channels to move in a transverse direction, relative to the longitudinal axis of the vehicle. An alternate embodiment replaces stability producing outriggers with sets of hydraulically actuatable wheels, mounted at right angles to the vehicle main propulsion wheels, which hydraulically actuatable wheels produce improved stability of the vehicle.

3,586,184
CONTROL APPARATUS AND METHOD FOR AN EXCAVATING SHOVEL
Joseph A. Pesavento, Pittsburgh, Pa., and Darl C. Washburn, Jr., Williamsville, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Feb. 18, 1969, Ser. No. 800,107
Int. Cl. B66c 1/00, 13/14
U.S. Cl. 214—136 15 Claims



Described is a control system and method for controlling a powered excavating shovel of the type having a boom extending from a main frame, and in which a digging bucket is carried at the lower end of a dipper stick reciprocable trans-

versely of the boom and pivotable relative to the main frame about an axis at right angles to the transverse movement paths. More specifically, the invention described herein relates to a control system in which signals representing desired horizontal and vertical forces for the digging bucket are obtained from a single two-axis master switch and translated into signals for controlling the application to the bucket of components of said forces through and in line with the dipper stick and through and in line with a hoist cable secured to the bucket and passing over a pulley at the outer end of the boom.

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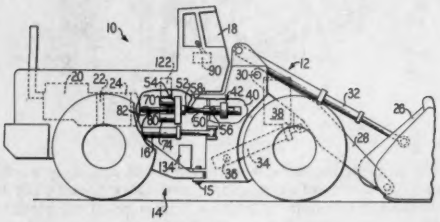
**3,586,185**
**ARTICULATE WHEEL LOADER HYDRAULIC SYSTEM**
**Lawrence F. Clancy, Peoria; Rodney H. Anderson, Naperville, and Emil B. Lee, Jr., Morton, all of, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**
**Filed May 26, 1969, Ser. No. 827,753**
**Int. Cl. E02f** *3/62*
**U.S. Cl. 214—140** **7 Claims**



An articulated wheel loader having the main hydraulic controls for the bucket mounted on the front frame and the main hydraulic controls for vehicle operation mounted on the rear frame, with only low pressure, low volume, hydraulic lines extending from the front frame to the rear frame.

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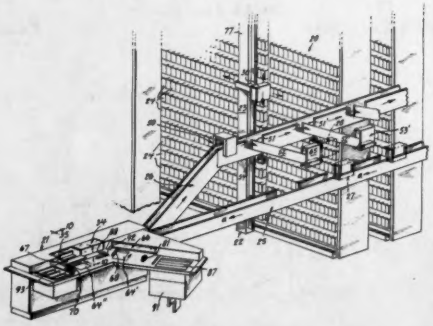
**3,586,186**
**METHOD OF VERIFYING ARTICLES IN A STORAGE AND RETRIEVAL SYSTEM**
**Joseph A. Powers, Williamsville, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.**
**Division of Ser. No. 675,502, Oct. 1967, Pat. No. 3,482,712.**
**Filed July 30, 1969, Ser. No. 860,460**
**Int. Cl. B65g** *1/06*
**U.S. Cl. 214—152** **4 Claims**



An article handling system adapted to accommodate large quantities of discreet articles, such as documents or the like. The system includes an operator control area, a storage area, article carrying containers, article identification means, and means for transporting the article carrying containers between the control and storage areas. The specific apparatus contemplated operates in a unique manner to verify that the proper article carrying container is transported to and made accessible at the control area. Verification is carried out in a manner such that a discreet article cannot be filed and subsequently stored in a container to which it does not correspond.

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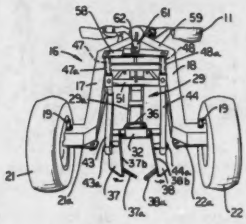
**3,586,187**
**AIRCRAFT TOWING APPARATUS**
**Preston M. Wright, R.R. 2, Box 110A, Syracuse, Ind.**
**Filed Mar. 6, 1969, Ser. No. 804,818**
**Int. Cl. B60s** *9/20*
**U.S. Cl. 214—332** **7 Claims**



The present invention is embodied in a powered towing apparatus for aircraft in which the aircraft and the driving wheels of the prime mover, or tractor component, are connected by a linkage which transfers a portion of the aircraft weight to the driving wheels to aid traction. The linkage grasps only the nose wheel tire on the aircraft and lifts the aircraft nose wheel through this tire grip. The tire gripping components adapt to a wide range of aircraft nose wheel tire size variations, both as to tire width and wheel diameter.

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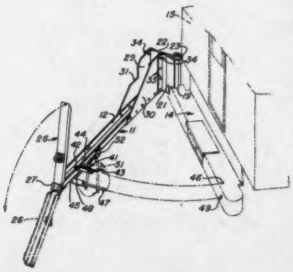
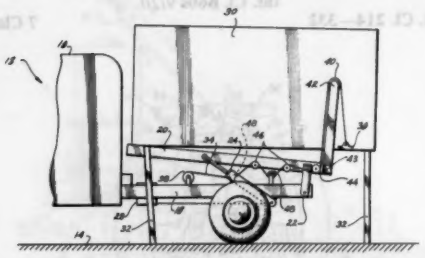
**3,586,188**
**MOTORCYCLE MOUNT FOR VEHICLES**
**William Edison Cambell, 1084 Rickenbacker St., San Jose, Calif. 95128**
**Filed Nov. 20, 1969, Ser. No. 878,292**
**Int. Cl. B60r** *9/00*
**U.S. Cl. 214—450** **5 Claims**



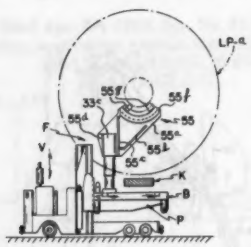
The disclosure relates to a carrier for two-wheeled mobile equipment such as motorcycles, scooters, bicycles and the like, which may be removably and pivotally mounted on a bumper of such four wheeled vehicles as campers, trailers, and similar motor vehicles. The carrier includes a channeled supporting element equipped with a self-contained extendable and retractable ramp for unloading and loading a two-wheeled equipment from and onto the supporting element, as well as equipped with a self-contained fold-up kick stand for supporting both the carrier and supported equipment, and also equipped with latching means for supporting the carrier and load on the bumper of a vehicle and in spaced relation thereto.

3,586,189
APPARATUS FOR DEMOUNTING AN ATTACHMENT FROM A TRUCK
Harold Tornheim, 430 N. Auburn Ave., Sierra Madre, Calif.
Continuation-in-part of application Ser. No. 749,358, Aug. 1, 1968. This application Aug. 4, 1969, Ser. No. 847,237
Int. Cl. B60p 1/64
U.S. Cl. 214—515 15 Claims



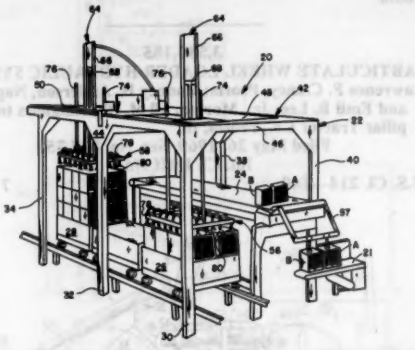
An inclinable pickup truck carriage together with a pair of demountable posts at the rear of the truck and a corresponding pair of tension lines can demount an attachment such as a camper from the truck. Each tension line runs from a point on the attachment, then over a sheave at the top of its post, and on to a point on the chassis. Between the sheave and the chassis, the tension line passes around pulleys located alternately on the side of the carriage and on the side of the chassis. The attachment can thus easily demount after the inclination of the carriage from a horizontal position, parallel to the truck chassis, into an inclined position, and after the insertion of supports between the attachment and the ground.

3,586,190
MOBILE PRECISION RIGGING APPARATUS
James W. Lafferty, Palos Verdes Estates, Calif., assignor to The Elwel-Parker Electric Company
Filed Mar. 14, 1968, Ser. No. 712,980
Int. Cl. B66f 9/12
U.S. Cl. 214—620 15 Claims



As a load manipulating fixture unit, two like hydraulically extensible columns mounting load-engaging fittings are supported on carriages hydromechanically shiftable for independently controlled transverse and fore and aft motions on a base receivable in the manner of a four-way pallet on the high lift platform of a high capacity industrial truck, providing a hydraulic power takeoff to the unit and having precision platform lifting-lowering, and vehicular steering, speed and acceleration control. Independent three-dimensional motions of each load fitting relative to the base, permitting shifting to accommodate and to change attitude of particular loads and complementing truck vehicular and lift motions, enable easy accurate manipulation of massive and/or bulky loads, e.g., in rigging operations, by single or joint truck action. A similar palletlike unit with opposable hinged load engaging faces is disclosed.

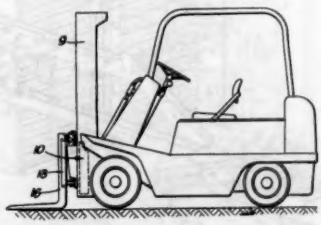
3,586,191
LOAD/UNLOAD TRANSFER CARRIAGE
John J. Brown, Jr., Siler City, N.C., assignor to Forrest Paschal Machinery Company, Siler City, N.C.
Division of Ser. No. 816,243. Filed Apr. 15, 1969, Ser. No. 816,274
Int. Cl. B65g 60/00
U.S. Cl. 214—6 FS 6 Claims



The present invention is directed to an article or package loading and unloading machine, and more specifically to a machine for transferring articles from a relatively stationary platform or fixed path conveyor to an adjacent, movable skid or car and simultaneously transferring articles from a second car located adjacent said stationary platform or conveyor into said platform.

Basically the machine comprises two vertically reciprocal pickup heads arranged in cooperating relationship on a single, horizontally reciprocal frame or carriage, one of the pickup heads transferring articles from the stationary platform to an adjacent, empty skid or other portable platform, and the second pickup head simultaneously transferring articles from a second loading skid onto the stationary platform during the return trip of the carriage.

3,586,192
INDUSTRIAL LIFT TRUCKS
Cecil Goodacre, Basingstoke, England, assignor to Lansing Bagnall Limited, Basingstoke, England
Filed Apr. 21, 1969, Ser. No. 817,712
Claims priority, application Great Britain, Apr. 23, 1968, 19178/68
Int. Cl. B66f 9/16
U.S. Cl. 214—701 8 Claims



In an industrial lift truck of the kind having a mast assembly, a load-lifting carriage mounted for sliding movement up and down the mast, and a load support carried on the carriage, the load support being capable of being moved transversely of the truck by means provided for this purpose, the load-lifting carriage comprises a rear part mounted on the mast assembly and a front part carrying the load support, the front part being pivotally connected to the rear part to pivot

about a horizontal transverse axis and being slidable together with the load support transversely of the rear part. There is provided a roller which contacts an up-and-down extending surface of one of said parts at a location below said horizontal transverse axis, which roller is mounted on the other part of the lifting carriage for rotation about an up-and-down extending axis and for movement in a fore-and-aft direction relatively to said other part. An hydraulic ram is provided to effect the fore-and-aft movement of the roller so as to effect tilting of the front part relatively to the rear part about said horizontal axis, the roller also acting as an antifriction support for the lower end of the front part of the carriage during the transverse movement of the front part of the carriage and the load support.

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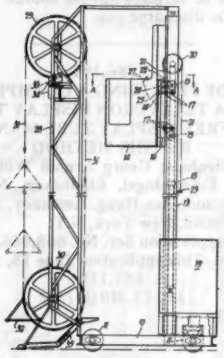
**3,586,193**

## MECHANICAL HANDLING EQUIPMENT

**Keith Wilkinson, Hertfordshire, England, assignor to Geo. W. King Limited, Stevenage, England**

**Filed May 21, 1969, Ser. No. 826,403**
**Claims priority, application Great Britain, May 21, 1968, 24277/68**
**Int. Cl. B65g** *47/56*
**U.S. Cl. 214—711** **9 Claims**



An apparatus for use in transferring goods from a storage rack to a discharge point and comprising a mobile frame or chassis which is guided for reciprocation along a predetermined path extending across the face of a storage rack and carries an operator's cabin or platform which is capable of being raised and lowered so that it may be located at a selected level in relation to the rack, there being an elevator also mounted on the frame or chassis and operable independently of the cabin or platform, the arrangement being such that with the operator's cabin or platform set at a selected level the operator will be able to transfer goods from the rack to the elevator for transfer to a lower level at which such goods may then be transferred to a delivery conveyor.

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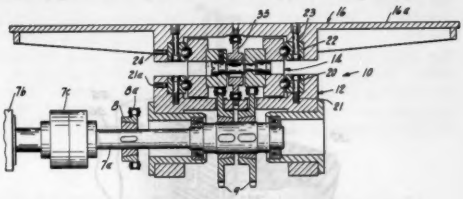
**3,586,194**

## ANTIFRICTION BEARING SUPPORT MEANS FOR A CRANE HAVING AN EXTENSIBLE SLIDE OR THE LIKE

**Max J. Dechantsretter, Milwaukee, Wis., assignor to Harnischfeger Corporation, West Milwaukee, Wis.**

**Filed Aug. 19, 1969, Ser. No. 851,239**
**Int. Cl. B66f** *9/14*
**U.S. Cl. 214—730** **1 Claim**

An improved antifriction bearing support for a load supporting slide of a crane, which slide is extendible on relatively moving members so as to be able to extend the load from the crane into a storage aisle or the like. The improved antifriction bearing support means includes ball races which are so formed that the hardened ball elements contact the opposed races at four points of contact, to thereby provide weight supporting thrust as well as lateral support thrust. An



improved drive means is also provided for laterally shifting the relatively moving slide members.

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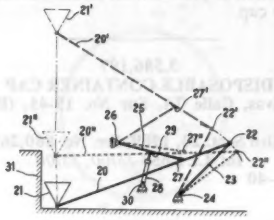
**3,586,195**

## DIGGING AND LIFTING DEVICE

**Osmano Beltrami, 220, Via Faentina, Ravenna, Italy**

**Filed Dec. 23, 1968, Ser. No. 786,200**
**Claims priority, application Italy, Feb. 7, 1968, 12472/68**
**Int. Cl. E02f** *3/62, 3/42*
**U.S. Cl. 214—770** **6 Claims**



A digging and lifting device having a bucket lifted by a pair of arms, each of which is on turn connected to the vehicle body through two connecting rods pivoted at one end and at an intermediate point thereof. The arms are in such a manner parallely controlled by an articulated quadrilateral so to impart to the bucket a substantially vertical path. In addition, a pair of articulated parallelograms maintain the bucket parallel to itself while being lifted and a movable ballast provides to limit within an acceptable range the equipment gravity center shiftings during the bucket operation.

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**3,586,196**

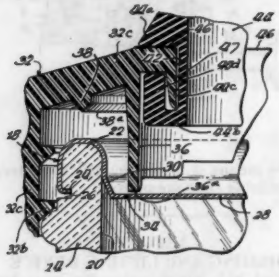
## NURSER

**Raymond W. Barton, and Joe Thomas Herron, both of Evansville, Ind., assignors to Mead Johnson & Company**

**Continuation-in-part of application Ser. No. 809,183, Mar. 21, 1969, now abandoned. This application Nov. 3, 1969, Ser. No. 873,459**
**Int. Cl. A61j** *9/04*
**U.S. Cl. 215—11** **11 Claims**

A nursing container assembly which includes a container member having an upstanding threaded neck portion for receiving a screwcap, with a nipple seated on the screwcap. A relatively thin wall closes the upper end of the neck portion and has score means on a portion thereof for facilitating separation of the wall when the wall is subjected to a concentrated pressure adjacent the score means. A projection means depends from the underside of the screwcap, spaced from the radial center of the screwcap, and has a blunt lower edge for separating the wall by a breaking action along the score means. The wall is recessed within the neck portion of the container member and comprises part of a crimp cap which is crimped over the outermost end of the neck and overlies the top marginal rim of the neck. An annular ridge depends from the underside of the screwcap and abuts against the portion of the crimp cap overlying the top mar-

ginal rim of the neck to provide a seal therebetween. The screwcap has a central opening about which the nipple is seated and a generally planar portion of the cap surrounds the opening. The nipple has a laterally extending peripheral



flange dimensioned to overlie said marginal planar portion and a relatively fine scoring means is formed on the area of the planar portion to provide vent means between the nipple and the screw cap.

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**3,586,197**

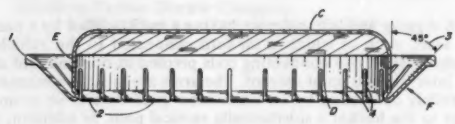
**DISPOSABLE CONTAINER CAP**

**Humberto Vivas, Calle 7A, Sur No. 19-45, (Estadio) Cali, Colombia**

**Filed Sept. 23, 1969, Ser. No. 860,260**

**Int. Cl. B65d** *23/00, 53/00*

**U.S. Cl. 215—40** **7 Claims**



A disposable container cap for soft drink bottles which is removable by hand pressure without an implement is provided including a cup portion joined through a skirt portion to a circular flange having an upwardly bended position along a circular bend line at an angle of about 45° to the cap axis, the flange portion having a plurality of elongated flutes and the areas defined between the flutes being provided with elongated recesses along the bend line and a bended bead arranged on the peripheral edge of the flange.

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**3,586,198**

**OSCILLOSCOPE DISPLAY FOR ELECTRIC DISCHARGE MACHINING APPARATUS AND THE LIKE**

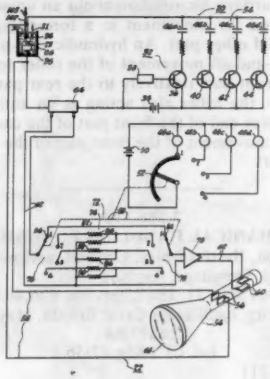
**Terry O. Hockenberry, Pittsburgh, Pa., assignor to Dr. Everard M. Williams, Pittsburgh, Pa. and Dr. Terry O. Hockenberry, Fox Chapel, Pa., part interest to each**

**Filed May 5, 1969, Ser. No. 821,641**

**Int. Cl. B23k** *9/16*

**U.S. Cl. 216—69** **13 Claims**

Gap discharge apparatus comprises an electrode tool and workpiece spaced to form a discharge gap therebetween. A circuit connects a source of unidirectional potential and pulse generating means for generating a series of pulses at given repetition rate, in series to the tool and workpiece for inducing repetitive discharges across the gap. An oscilloscope, with angularly disposed deflecting means, has one of its deflecting means coupled to the tool and workpiece in electrical parallel with the discharge gap, and another of its



deflecting means in series with the source and the tool or workpiece and the discharge gap.

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**3,586,199**

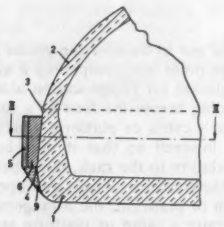
**METHOD OF PROVIDING A CLAMPING STRAP AROUND A TELEVISION DISPLAY TUBE AND IMPLOSION-FREE DISPLAY TUBE MANUFACTURED BY THIS METHOD**

**Willem Fokko Nienhuis; Georg Arnold Willem Jacob Spakhoff, both of Emmasingel, Eindhoven, Netherlands, and Klaus Boke, Brand, Am Hang, Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation of application Ser. No. 668,066, Sept. 15, 1967, now abandoned. This application June 18, 1969, Ser. No. 851,118**

**Int. Cl. H01k** *1/42*

**U.S. Cl. 220—2.3** **5 Claims**



An implosion-free cathode-ray tube is disclosed in which a clamping strap is provided around the envelope of the tube in proximity to the juncture of the cone and window and spacing members, such as wedge-shaped parts, are inserted between the clamping strap and the envelope to increase tension in the strap.

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**3,586,200**

**CARRYING HANDLE**

**Sol Kramer, Baltimore, Md., and Charles Gretz, Los Angeles, Calif., assignors to Life-Like Products, Inc., Baltimore, Md.**

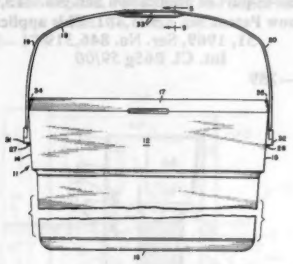
**Filed Nov. 1, 1968, Ser. No. 772,561**

**Int. Cl. B65d** *25/32*

**U.S. Cl. 220—94** **9 Claims**

A flexible handle is provided for attachment to large con-

tainers, such as picnic chests, baskets, luggage, and the like, in the form of a strap having snap fasteners at either end to



connect to the container, and a relatively stiff medial portion as a hand grip.

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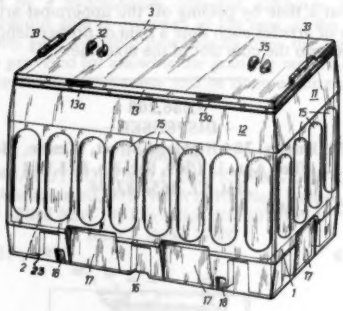
**3,586,201**
**NONWETTING PACKING FOR FRESH FISH**
**Claus Ebert, Schonberg, Taunus, Germany, assignor to Iltur AG, Schutzenweg, Switzerland**
**Filed July 16, 1969, Ser. No. 842,255**
**Claims priority, application Germany, July 18, 1968, P 17 61 888.1**
**Int. Cl. B65d *25/18***
**U.S. Cl. 220—9** **19 Claims**



The invention concerns a double wall container for shipping perishable goods, such as fish which must be kept cold. The container has a foamed plastic inner boxlike part open at the top and having a lid. The container also has an unfoamed plastic outer part which embraces the inner part at the top top thereof but is spaced from the inner part at the sides, ends, and bottom of the inner part, a drain opening in the bottom wall of the inner part drains fluids, as from melted ice, into the space between the parts and the outer part has a drain port which can be opened when desired. The container is arranged for being stacked in interlocking relation with other like containers and can be provided with banding straps to lock the lid in place or to hold stacked containers together.

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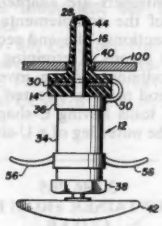
**3,586,202**
**PLUGGING DEVICE**
**Ray F. Shores, 1930 Scarles Road, Baltimore, Md.**
**Division of Ser. No. 646,405, Pat. No. 3,504,420. Filed July 1, 1969, Ser. No. 851,122**
**Int. Cl. B65d *39/12***
**U.S. Cl. 220—24.5** **3 Claims**

An expansible plug device molded from flexible material. The plug is formed having an extensible neck in attachment with a right cylindrical shoulder portion. A washer is molded within the shoulder for reinforcement. The plug is adapted for insertion using a hand-actuated plunger tool. The tool is characterized in utilizing a fork-shaped plug mount cooperat-



ing with mated keyways situated within the plug shoulder and beneath the washer.

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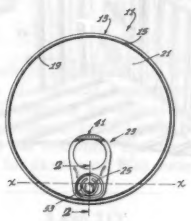
**3,586,203**
**LEVER TAB FOR EASY OPEN CONTAINER**
**George T. Powell, Dayton, Ohio, assignor to Ermal C. Fraze, Dayton, Ohio**
**Filed Sept. 4, 1969, Ser. No. 855,190**
**Int. Cl. B65d *17/20***
**U.S. Cl. 220—54** **8 Claims**



This disclosure describes a sheet metal tab which includes a nose end and a lifting end and means for stiffening the tab longitudinally. The tab has a zone adjacent the nose end thereof for attachment to an easy opening container wall. The sheet material of the tab is severed along a path which extends at least partially around such zone and which permits the tab to pivot about a line rearwardly of such zone when the tab is affixed to a can end.

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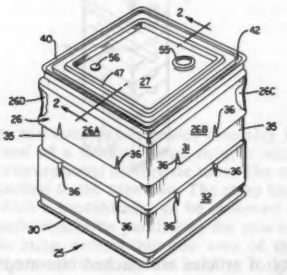
**3,586,204**
**CONTAINER AND METHOD OF MAKING SAME**
**Ralph E. Roper, Indianapolis, Ind., assignor to Wallace Expanding Machines, Inc., Indianapolis, Ind.**
**Filed July 25, 1969, Ser. No. 844,815**
**Int. Cl. B65d *7/42***
**U.S. Cl. 220—67** **9 Claims**



A container having an expanded rectangular tubular body section and a pair of opposing end panel sections. The body

section includes a peripheral recess which facilitates lifting the container by, for example, the arms of a fork lift truck. For strengthening purposes the body section incorporates a plurality of gussets which are adjacent to the edge of said lifting recess. Such containers are adapted to stack one upon another by means of the complementary configurations of the two end panel sections. The end sections are secured to the body section by means of crimping or by a curled lock seam. In one embodiment of the invention crimping and decrimping of one end may be effected my means of crimping and decrimping tools having C-shaped heads which are adapted to engage the outer leg of a U-shaped rim.

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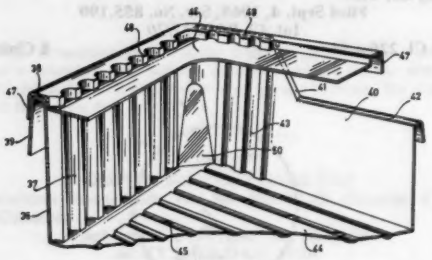
**3,586,205**

**TRANSPORT CONTAINER FROM PLASTICS WITH COVER**

**Leendert Van Daalen, Slikkerveer, Netherlands, assignor to N.V. Plastic Industrie van Daalen, Sliedrecht, Netherlands**

**Filed Jan. 22, 1969, Ser. No. 793,146**
**Claims priority, application Belgium, Jan. 25, 1968, Feb. 21, 1968, 53,762;54,487**
**Int. Cl. B65d** *21/06*
**U.S. Cl. 220—97** **2 Claims**



A thin-walled transport container made from plastic material, is provided with detachable supporting faces near two oppositely situated walls for supporting the bottom of a similar container to be stacked thereon and is situated below the upper edge of the walls. The supporting faces constitute a part of a cover to be placed on the container.

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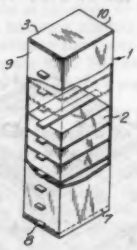
**3,586,206**

**CONTAINER FOR A STACK OF ARTICLES**

**Bess P. Gilmore, and John C. Gilmore, both of 11 Hardening Lane, Westport, Conn.**

**Filed Apr. 29, 1969, Ser. No. 820,068**
**Int. Cl. B65d** *83/00, 5/48, 25/22*
**U.S. Cl. 221—89** **3 Claims**



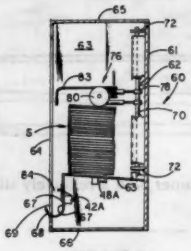
A plurality of articles are stacked one atop another in a container with removable separator strips therebetween as a packaged unit ready for sale, and a portion of the container is removable to enable subsequent removal of the lowermost of the articles, one by one.

**3,586,207**

**COIN OPERATED BAG AND MAGAZINE DISPENSER**

**Stanley Brenner, Massapequa, N.Y., assignor to John R. Lebb Distributors Inc., New York, N.Y.**

**Continuation-in-part of application Ser. No. 715,935, Mar. 25, 1968, now Patent No. 3,503,481. This application July 31, 1969, Ser. No. 846,319**
**Int. Cl. B65g** *59/00*
**U.S. Cl. 221—259** **8 Claims**



This disclosure is directed to a dispenser and more specifically to a coin actuator dispenser for dispensing plastic shopping bags, magazines or other like articles. The dispenser comprises essentially a housing for containing a stack of superposed plastic bags, magazines or articles in which a mean is provided for individually dispensing the articles one at a time by peeling off the uppermost article from the stack of articles each time a coin of proper denomination is inserted into the coin slot of the machine.

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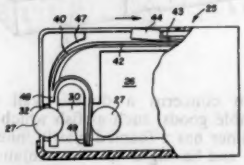
**3,586,208**

**DISPENSER**

**Charles M. Hussey, 304 Highland Street, Weston, Mass.**

**Filed Apr. 1, 1969, Ser. No. 811,948**
**Int. Cl. B65d** *83/04*
**U.S. Cl. 221—299** **13 Claims**



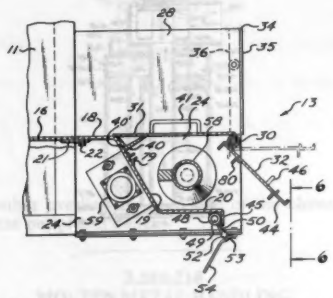
A pill dispenser is formed with a housing having a trap chamber through which pills are dispensed one at a time by means of a slider formed of resilient material having a gating band arranged for moving between two positions. In a normally assumed first position, the gating band closes the trap chamber outlet and leaves the inlet open so that a pill can enter the trap chamber. In an actuated second position, the gating band closes the inlet to prevent entry of any more pills into the trap chamber, and opens the outlet so that the trapped pill can be dispensed by itself. Both the gating band and the spring band are deformed and flexed when moved to the second position so that they each urge the slider back to its normally assumed first position to close the dispenser. The openings in the dispenser are preferably hermetically sealed by a tear-away strip, and the dispenser can be formed either with an integral pill storage chamber or as part of a closure for the neck of a pill bottle.

3,586,209

## TAILGATE SPREADER WITH HOPPER BYPASS COVER

John A. Keller, Bucyrus, Ohio, assignor to Shunk Manufacturing Co., Inc., Bucyrus, Ohio

Filed Sept. 8, 1969, Ser. No. 856,075
Int. Cl. A01c 15/00
U.S. Cl. 222—178 13 Claims



A dump truck is provided at its rearmost end with a laterally elongated hopper having a screw feed conveyor therein adapted to convey sand, salt, cinders or other granular material to an opening in the bottom of the hopper. A self-leveling, rotatable sand spreader is disposed beneath the opening in the hopper, the location of the said opening being controlled by a hydraulically actuated discharge plate. A hinged cleanout gate is provided at the rear of the hopper, and a dump gate, foldable downwardly over the top of the hopper, is provided for allowing the granular material to pass over the spreading mechanism and be dumped directly from the truck.

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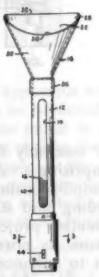
3,586,210

## MANUALLY PORTABLE DISPENSING DEVICE

Judith E. Andamasaris, 718 North Drive, New Buffalo, Mich.

Filed Nov. 17, 1969, Ser. No. 877,309
Int. Cl. B65g 59/00
U.S. Cl. 221—290 6 Claims



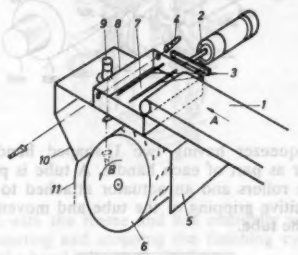
A chip dispensing device which is manually portable for dispensing a chip at any location of a game board by depressing the distal end of the dispensing device against the surface of the game board and removing same. This invention comprises a tubular member, the distal end of said tubular member adapted to contain an axially movable, spring biased ring for actuating spring elements for retaining and releasing individual chips from a columnar stack, and the other end of said tubular member being removably fitted with a scoop funnel shaped for manual holding.

3,586,211

## FEEDING DEVICE FOR TANGLED TOBACCO FRAGMENTS OR STANDARD CUT-LEAF TOBACCO

Francis Bonneric, Fleury-les-Aubrais, France, assignor to Service D'Exploitation Industrielle des Tabacs et des Allumettes, Paris, France

Filed Mar. 28, 1969, Ser. No. 811,298
Claims priority, application France, Mar. 29, 1968, Apr. 8, 1968, Sept. 12, 1968, 146,390;147,342;165,971
Int. Cl. B67d 5/08, 5/12
U.S. Cl. 222—56 9 Claims



A device for constituting substantially constant volumetric doses from a mass of material composed of tangled fragments, comprising a chamber having an inlet and an outlet, means for supplying material to said chamber and connected to said inlet, means for retaining the material at said inlet, and movable means for closing off said outlet.

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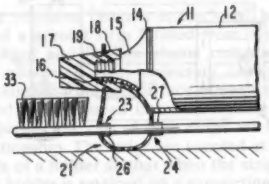
3,586,212

## TOOTHPASTE TUBE AND TOOTHBRUSH HOLDER ASSEMBLY

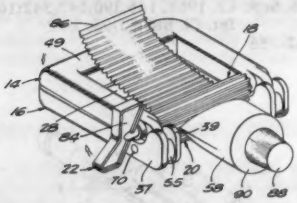
Andreas J. Tzouras, 1570 Jackson Street, #303, Oakland, Calif., and George Agouridis, 1384 Oakland Avenue, Apt. 26, Walnut Creek, Calif.

Filed Sept. 5, 1969, Ser. No. 855,717
Int. Cl. B65d 35/24
U.S. Cl. 222—93 14 Claims



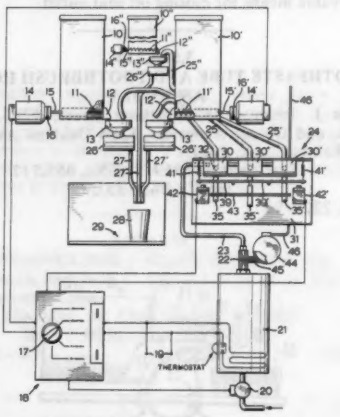
A toothpaste and toothbrush holder assembly is disclosed whereby one end of a flexible hinge strap is mounted near the spout of a conventional toothpaste tube. The other end of the strap is attached to the tube cap. The strap loop contains two slots in which a toothbrush can be mounted so that the toothbrush handle would be parallel to the axis of the tube. Portions of the strap extend into the area of the slot and press against the toothbrush handle holding it tightly within the slot. The slots are positioned on the strap to keep the brush bristles out of contact with the cap, and the axis of the slots can intersect the axis of the seam closing the end of the tube for ease in packing.

3,586,213
TUBE SQUEEZER APPARATUS
John B. Gill, P. O. Box 546, Mineral Wells, Tex.
Filed Oct. 20, 1969, Ser. No. 867,663
Int. Cl. B65d 35/28
U.S. Cl. 222—102 5 Claims



A tube squeezer having two U-shaped handles and a geared roller as part of each handle. A tube is positionable between the rollers and an actuator attached to one roller causes a positive gripping of the tube and movement of the rollers and the tube.

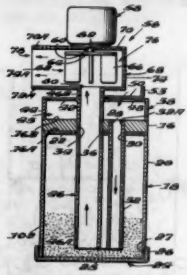
3,586,214
DISPENSING MACHINES WITH MULTIPLE SELECTION
Howard Diebel, Jordon Station, Ontario, Canada, assignor to Moyer Diebel Limited, Jordon Station, Ontario, Canada
Filed Jan. 21, 1969, Ser. No. 792,363
Int. Cl. B67d 5/60
U.S. Cl. 222—129.4 6 Claims



In a hot drink dispensing machine with multiple selection the valve means for selectively feeding not water from a source thereof to a mixing station where the hot water is mixed with a drink component preferably is arranged so that one of the valves is always in open condition to maintain a constant characteristic from the hot water supply onwards, so that a constant quantity of hot water is dispensed each time; the system also includes a venturi and a reservoir to maintain the hot water level constant.

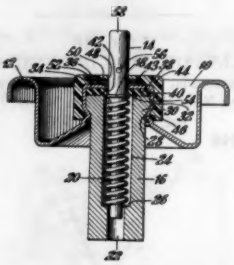
3,586,215
PLANT DUSTING APPARATUS
John F. Roche, 1259 W. 71st Terrace, Kansas City, Mo.
Filed June 24, 1969, Ser. No. 835,985
Int. Cl. B67d 5/54
U.S. Cl. 222—193 11 Claims

Apparatus for dispensing dry powdered, particle or particulate compositions of matter on plantlife and including a handle, means on the handle for supporting a receptacle for the matter, and pump means carried on the supporting means



and operatively connected with the receptacle to effect broadcasting of the matter.

3,586,216
IMPROVED AEROSOL VALVE WITH GASKET DEFORMATION TO ENHANCE SEALING
Gilbert S. Jordan, Monroe, and Norman Usen, West Haverstraw, both of, N.Y., assignors to Union Carbide Corporation, New York, N.Y.
Filed Nov. 1, 1968, Ser. No. 772,704
Int. Cl. B65d 83/00
U.S. Cl. 222—402.12 3 Claims



An improved valve assembly for an aerosol dispensing system is provided comprising a valve stem movable between a dispensing and a nondispensing position and a sealing gasket tightly surrounding said stem. An annular protuberance in said valve assembly projects against the gasket and deforms the gasket from its normal shape compressing it against the valve stem to enhance the sealing action. By a further aspect of the invention, a lubricator washer and a retaining lubricator cap are positioned externally of the container of the dispensing system to provide lubrication of the valve stem overcoming undue resistance to axial movement thereof.

3,586,217
MEASURING AND DISPENSING PACKAGE
William P. Jacobson, Rockford, Ill., assignor to Anderson Bros. Mfg. Co., Rockford, Ill.
Filed Feb. 20, 1969, Ser. No. 801,062
Int. Cl. G01f 11/28
U.S. Cl. 222—457 4 Claims

A container is formed with an outwardly extending

peripheral flange at its open side and with a U-shaped measuring and dispensing channel in the peripheral flange. A

cover member overlies the open side of the channel and is sealed to the peripheral flange.

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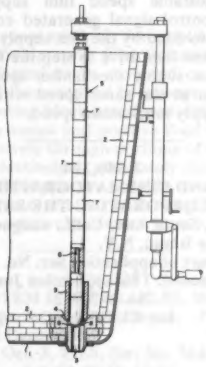
**3,586,218**
**MOLTEN METAL HANDLING**
**John David Sharp, Nechells, England, assignor to Foseco International Limited**
**Filed May 21, 1969, Ser. No. 826,513**
**Claims priority, application Great Britain, May 21, 1968, 24193/68**
**Int. Cl. B67d** *3/00*
**U.S. Cl. 222—559** **4 Claims**



Parts of metal handling apparatus which are adapted to be relatively movable tend to be hindered in such movement by the solidification of molten metal in contact therewith. To avoid this, prior to pouring molten metal into the apparatus, there are located at positions in the apparatus where such solidification would cause such hindrance, shapes of bonded fibrous material which are adapted to be burnt, melted or softened at the temperature of the molten metal.

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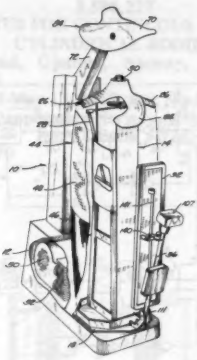
**3,586,219**
**STEAM-AIR FINISHER WITH COLLAR PRESS**
**David L. Radford, Salt Lake City; Ray F. Trottier, Salt Lake City, and Micheal G. Beeley, North Salt Lake City, all of, Utah, assignors to McGraw - Edison Company, Elgin, Ill.**
**Filed Aug. 28, 1968, Ser. No. 853,893**
**Int. Cl. D06c** *15/00*
**U.S. Cl. 223—57** **14 Claims**

A steam-air finisher having a frame including a shoulder and neck form upon which a garment can be dressed, and means for discharging heated air and steam to within the garment during a finishing cycle, specifically including a release mechanism that automatically releases a garment-holding clamp at the conclusion of the finishing cycle, further including a hood that fits over the form and an inflatable bag within the hood operable upon inflation with heated air to press against the garment collar, and further including a console



that swivels with the frame and has manually actuated elements for starting and stopping the finishing cycle and for positioning the hood relative to the form.

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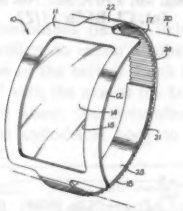
**3,586,220**
**STRIP FASTENER FOR HOLDERS**
**Adolph Reinsberg, Miami, Fla., assignor to Cobbs Manufacturing Company, Des Moines, Iowa**
**Filed Dec. 18, 1968, Ser. No. 784,605**
**Int. Cl. A44c** *5/00*
**U.S. Cl. 224—28** **9 Claims**



A pressure sensitive fastener is disclosed herein having a first strip and a second strip formed from a single extruded sheet of resilient and flexible plastic composition having a plurality of elongated ribs projecting outwardly in fixed parallel relationship from the surface of each strip. The strips being adapted to be pressed into interlocking releasable engagement whereby the ribs of both strips are intermeshed in gripping relationship. The strips are secured at one end to the opposite ends of a holder so that when the strips are fastened together, the holder is retained on a supporting structure.

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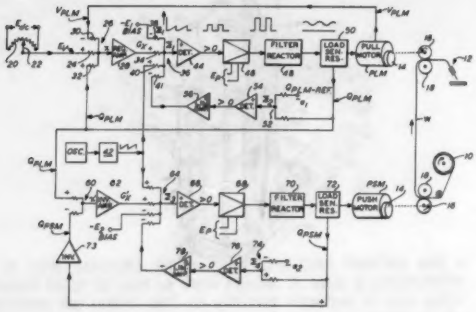
**3,586,221**
**TORQUE CONTROL OF MULTIPLE MOTORS FOR UNIFORM FEED OF WELDING WIRE**
**Marvin Rosen, Clark, N.J., assignor to Air Reduction Company, Incorporated, New York, N.Y.**
**Filed Aug. 28, 1969, Ser. No. 853,871**
**Int. Cl. B65h** *23/22*
**U.S. Cl. 226—1** **11 Claims**

A multiple servo load torque control system for uniform push-pull feed of welding wire from a supply reel to a welding gun comprises a "pull" servo motor at the welding gun and a "push" servo motor in tandem between the gun and reel for feeding the wire; a pull motor speed regulating amplifier having as input a wire speed reference signal, with velocity and load torque feedback signals from the pull motor; a push motor load torque regulating amplifier having as

input a load torque master signal from the pull motor proportioned according to desired division of load torque between the motors, and a load torque comparing signal form the



push motor; both servomotors receiving respectively amplifier regulated power through time-ratio-control transistorized power switching, and having torque limiting overload control.

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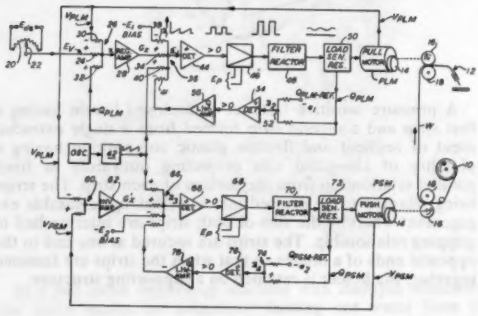
**3,586,222**

**SPEED CONTROL SYSTEM FOR MULTIPLE MOTOR FEED OF WELDING WIRE**

**Marvin Rosen, Clark, N.J., assignor to Air Reduction Company, Incorporated, New York, N.Y.**

**Filed Aug. 28, 1969, Ser. No. 853,870**
**Int. Cl. B65h *23/22***
**U.S. Cl. 226—1** **13 Claims**



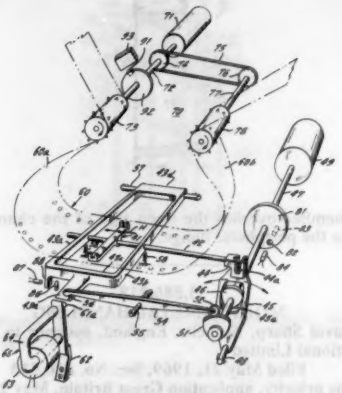
A multiple servo synchronized speed control system for uniform push-pull feed of welding wire between a supply reel and a welding gun comprises a "pull" servomotor at the gun and a slaved "push" servomotor in tandem between the gun and reel for feeding the wire; a pull motor speed regulating amplifier having as input a wire speed reference signal, with velocity and load torque feedback signals from the pull motor; a push motor speed regulating amplifier having an input a slaving velocity signal from the pull motor and a velocity comprising signal from the push motor; both servomotors receiving respectively amplifier regulated power through time-ratio-control transistorized power switching, and having torque limiting overload control.

**3,586,223**

**FLICKERLESS PROJECTOR**

**Howard B. Betts, Mineola, N.Y., assignor to Vanguard Instrument Corporation, Melville, L.I., N.Y.**

**Filed Mar. 10, 1969, Ser. No. 805,521**
**Int. Cl. G03b *1/28***
**U.S. Cl. 226—9** **9 Claims**



A motion picture projector includes a stepping mechanism running at constant speed as an intermittent film drive, and a continuously adjustable speed film supply or metering mechanism. A control signal generated each time a frame length of film is provided by the film supply mechanism actuates the intermittent film drive to step the film at a rate controlled by the film supply mechanism speed, with the film drive moving film at the same speed within each step regardless of the supply mechanism speed.

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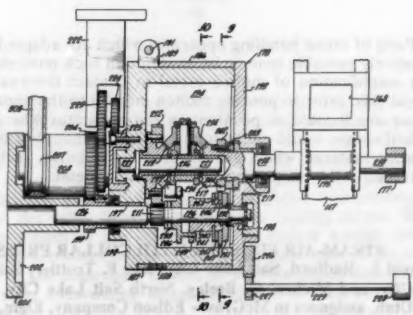
**3,586,224**

**FILM DRIVE, AND CINEMATOGRAPHIC APPARATUS INCORPORATING THE SAME**

**Lloyd M. Adams, Santa Ana, Calif., assignor to Geotel, Inc., Amityville, Long Island, N.Y.**

**Continuation-in-part of application Ser. No. 528,718, Feb. 21, 1966, now abandoned. This application June 16, 1969, Ser. No. 843,892**
**Int. Cl. G03b *1/24***
**U.S. Cl. 226—76** **23 Claims**



A cinematographic apparatus which incorporates, as the film-drive mechanism therein, a differential gear having two inputs and one output, the latter being connected to the sprocket which drives the film. One of the inputs is driven at a constant speed, and the other is driven alternately in opposite directions by cam means, the cam means being so shaped that the film will alternately advance and dwell in intermittent manner. Locking means are provided to insure

that the film remains absolutely stationary during each dwell period, despite variations of or wear in the drive means. Means are provided to disengage the cam means from such other input, so that the film may be driven rapidly in a nonintermittent manner and still maintain precise framing. Framing means are provided to achieve correct framing, in a manner which is not subject to creep, without destroying the proper phase relationship with the shutter.

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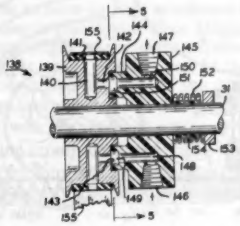
### 3,586,225
### TRANSPORTING SPOOL ASSEMBLY FOR STRIP-LIKE MATERIAL

**Victor Takata, Cambridge, Mass., assignor to Artisan Industries Inc., Waltham, Mass.**

**Division of Ser. No. 578,768, Sept. 12, 1966, Pat. No. 3,474,945. Filed July 2, 1969, Ser. No. 838,588**
**Int. Cl. B65h 17/30**
**U.S. Cl. 226—95** **2 Claims**




A transporting spool assembly for striplike material for example, striplike photographic film, this assembly including a spool element adapted to be mounted on and turn with a rotating shaft and characterized by passages in itself and having a fluid distributing block associated with it as part of the assembly whereby vacua and positive fluid pressures may be applied to it effectively through portions of its material transporting surface selectively to alternately increase the tractive effect of the spool element on striplike material transported on and by it and then at a particular angular attitude cause the material to be positively released from it.

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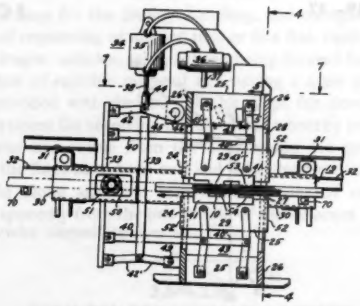
### 3,586,226
### PULLING SYSTEM FOR PARALLEL-WIRE STRAND

**Charles R. Nippert, Sr., Allentown, Pa., assignor to Bethlehem Steel Corporation**

**Filed Oct. 3, 1968, Ser. No. 764,689**
**Int. Cl. B65h 17/36**
**U.S. Cl. 226—163** **8 Claims**




Apparatus for pulling parallel-wire strand, prior to winding on a takeup drum, including a clamping device comprising a plurality of clamping members arranged to define an opening for the wire strand and adapted to simultaneously apply pressure to all sides of the wire strand. The clamping device is mounted on a reciprocating carriage which advances short lengths of strand sequentially.

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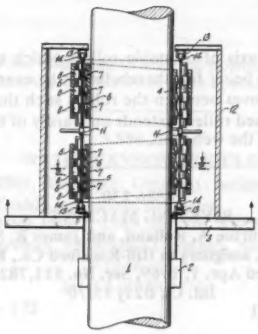
### 3,586,227
### APPARATUS FOR CONTINUOUS FEEDING OF CYLINDRICAL BODIES

**Harald Krogsrud, Gjettum, Norway, assignor to Elektrokemisk A/S**

**Filed May 13, 1969, Ser. No. 824,036**
**Claims priority, application Norway, May 21, 1968, 1983/68**
**Int. Cl. B65h 17/24**
**U.S. Cl. 226—170** **10 Claims**



One or more continuous flexible belts are disposed on housing-mounted rollers to retain a substantially cylindrical body with a portion of the belt(s). Each belt forms an angle between 0° and 90° with the axis of the body. One surface of each belt is moved about the circumference of the body, thereby causing the cylindrical body to move axially with respect to each belt.

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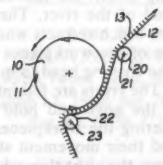
### 3,586,228
### FABRIC CONVEYOR FOR USE IN CONJUNCTION WITH ELECTRIFIER CYLINDERS

**Heinz Hergert, Frankfurt am Main, Germany, assignor to Polrotor Inc., East Farmingdale, N.Y.**

**Filed Oct. 17, 1969, Ser. No. 867,253**
**Int. Cl. B65h 17/20**
**U.S. Cl. 226—180** **10 Claims**



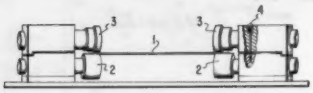

A fabric transport carriage is used which permits rotation of the axis of a feeder roll substantially about the fixed axis of a delivery roll. The rolls are unconnected by the conventional apron conveyor and the fabric bears directly on the surface thereof.

3,586,229

## METHOD AND APPARATUS FOR FEEDING WEBS

Masayuki Kamada; Yoshiaki Tamura; Akiwo Takanami; Akira Ikeda, and Kinichi Araki, all of No. 210 Nakanuma, Minami-Ashigara-Machi, Ashigara-Kamigun, Kanagawa, Japan

Filed July 18, 1968, Ser. No. 745,743
Claims priority, application Japan, July 26, 1967, 42/48054
Int. Cl. B65h *17/20*
U.S. Cl. 226—180 1 Claim



Inclining the axis of rotatable rollers which sandwich the edges of a web being fed therebetween to exert tension on the web as it moves between the rollers such that the center line of the inclined rollers extends outwardly of the web edge in a direction of the web feed.

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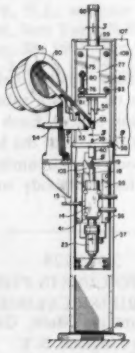
3,586,230

## RIVETING MACHINE

F. Leroy Hill; Burton A. Rolland, and James R. Stamm, all of Rockford, Ill., assignors to Hill-Rockford Co., Rockford, Ill.

Filed Apr. 1, 1969, Ser. No. 811,782
Int. Cl. B21j *15/10*
U.S. Cl. 227—51 35 Claims



This riveting machine has a reciprocating pneumatic riveter head located below the work table. Its pneumatic piston, carrying a peen, is rotated by an electric or pneumatic motor for spin-impact riveting. This head is mounted on a slide which is raised vertically to operating position in timed relation to corresponding downward movement of an anvil which backs up the head of the rivet. The workpieces are positioned on a pilot pin, which retracts when the rivet is inserted through the holes of the workpieces and then moves aside to made way for the riveting head to move up into position and form the rivet. The rivets are fed into spring-pressed jaws which move with the anvil and hold the rivet by its shank until it starts entering the workpieces at which point the jaws are opened and their movement stopped while the anvil moves down to press the rivet through the workpieces. The pilot pin is held in position by a spring or small air cylinder so valved that when the rivet presses against it, retraction of the pin is accomplished by the air cylinder. A cam on the slide holding the riveter head moves the pilot pin and air cylinder to one side for the riveting operation.

The movement of the anvil is accomplished by an air cylinder and when the anvil has pushed the rivet through the workpieces, a horizontal wedge is moved by an air cylinder into a slot in the anvil producing a final movement forcing the rivet and workpieces tightly together and furnishing a solid backing for the anvil.

Upon completion of the riveting operation, the riveting head and anvil retract and the pilot pin automatically returns to its original position with the pin projecting through the table.

The sequence of operations is started by a foot switch or valve.

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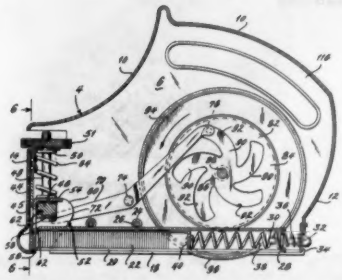
3,586,231

## STAPLING MACHINE

Leroy H. Wilson, 5 Burruss Square, Lynn, Mass.

Filed Oct. 2, 1969, Ser. No. 863,221
Int. Cl. B25c *5/06*
U.S. Cl. 227—111 13 Claims



A stapling machine includes a housing having a drive wheel journaled therein, and a portion of the drive wheel projects beyond the housing and engages the surface across which the machine is advanced. As the machine advances across the surface the drive wheel rotates and drives a trip wheel having camming surfaces which move an operating lever. The operating lever cocks a hammer against the bias of a drive spring so that when the trip wheel releases the lever staples are driven from a magazine located in the path of the hammer through the housing. Thus, staples are driven automatically at spaced intervals as the stapling machine is advanced across the surface. The trip wheel may also be rotated independently by an operating handle so that staples can be inserted individually at selected locations.

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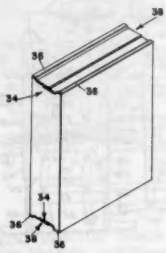
3,586,232

## CARTON

John W. Scully, Raynham, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Filed Feb. 6, 1969, Ser. No. 797,185
Int. Cl. B65d *5/02*
U.S. Cl. 229—37 5 Claims



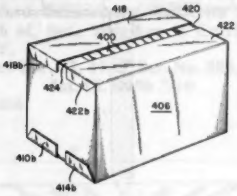
A package comprising a filled and sealed carton having a bottom shaped to permit the package to be supported in an upright position on a horizontal surface without leaning or tipping.

**3,586,233**

## REINFORCED SHIPPING CONTAINER

**Roger L. McCulloch, Elmhurst, Ill., assignor to Boise Cascade Corporation, Boise, Idaho**

**Filed May 12, 1969, Ser. No. 823,738**
**Int. Cl. B65d** *5/02*
**U.S. Cl. 229—37 R** **4 Claims**




A blank foldable to form an edge reinforced box or carton, said blank including a plurality of flaps hingedly connected with the horizontal edges of the end and sidewalls, respectively, for closing the upper or lower end of the box. The invention is characterized in that at least one of the top or bottom end flaps contains a pair of slits that define glue tabs hingedly connected with the adjacent edges of the side flaps, said glue tabs being arranged longitudinally to extend around an edge of the box into sealed engagement with the outer surface of the adjacent end wall, thereby to strengthen and reinforce the box edge.

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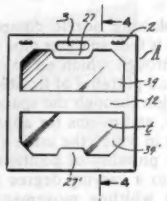
**3,586,234**

## PACKAGE FOR TILES AND THE LIKE

**Bernard Nathan, and Gary L. Tate, both of Vincennes, Ind., assignors to Hamilton of Indiana, Inc., Vincennes, Ind.**

**Filed July 9, 1969, Ser. No. 840,343**
**Int. Cl. B65d** *5/02*
**U.S. Cl. 229—40** **8 Claims**




A package for the display, handling, and transporting of a series of registering or aligned tiles or like flat, rigid, yet relatively fragile, articles; said package being formed from a single blank of suitable material and having a main panel section provided with die-cut, foldable flaps for developing a compartment for receiving the tile stack, whereby portions of the latter are visible from the openings in the panel from which the flaps have been cut, and side wings and end panels foldable along side and transverse margins of said main panel, spacedly from the line of fold of the adjacent flaps, for closurewise disposition over said flaps.

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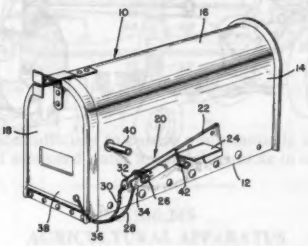
**3,586,235**

## DELIVERY BOX SIGNALING DEVICE

**Cromer H. Fishel, Rte. 5, Clemmons, N.C. 27012**

**Filed Aug. 4, 1969, Ser. No. 847,068**
**Int. Cl. A47g** *29/12*
**U.S. Cl. 232—35** **1 Claim**

A rural mailbox signaling device having a pair of signaling flags pivotally secured to the box so that movement of the box door from a closed to an opened position will lower one flag and raise the other flag to selected positions to notify the box owner when the box door has been operated.

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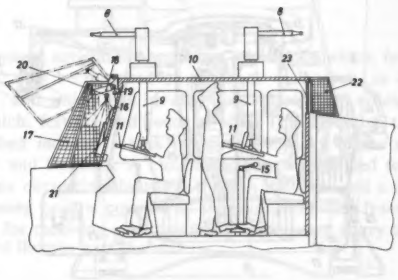
**3,586,236**

## WATER CANNON VEHICLE

**George Schaffler, Augsburg, Germany, assignor to Keller & Knappich GmbH, Augsburg, Germany**

**Filed June 2, 1969, Ser. No. 829,535**
**Claims priority, application Germany, Nov. 2, 1968, P 18 06 595.7**
**Int. Cl. B05b** *17/00*
**U.S. Cl. 239—172** **11 Claims**




A motor-driven water cannon vehicle having a cabin with a roof which includes swivel mountings for supporting a plurality of water nozzles. The cabin includes a windshield with a protective screen or grating mounted over it. Water nozzles are also provided on the sides of the vehicle to protect blind spots. The windshield also includes wipers and solvent wash sprays to clear away paint or chemicals used against the vehicle.

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**3,586,237**

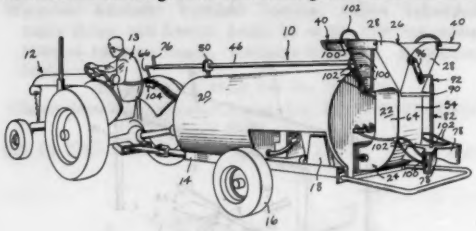
## SPRAYING DEVICE

**Milton L. Taylor, 3586 Tabor Road, Sodus, Mich.**

**Filed June 12, 1968, Ser. No. 832,575**
**Int. Cl. B05b** *7/26*
**U.S. Cl. 239—78** **4 Claims**

A spraying device including an air blower mounted to a frame and a duct having one end connected to the air blower for receiving forced air therefrom. The opposite end of the duct defines a pair of oppositely directed discharge heads which project from opposite sides of the spraying device and which each have an outlet mouth. Nozzle means are connected to a source of spray material and are adapted to project spray material into the path of the forced air passing

through each outlet mouth. Means are mounted in the duct between the discharge heads for causing said forced air to be



diverted into a selected one of the discharge heads and out the outlet mouth associated therewith.

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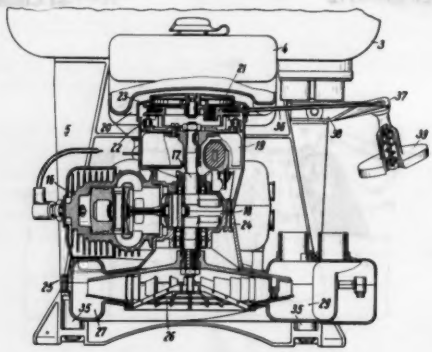
**3,586,238**
**PLANT TREATING APPARATUS ADAPTED TO BE CARRIED ON A PERSON'S BACK**

**Heinz Schmierer, Maichingen; Hans Peter Stihl, Hochberg, and Gerhard Zerrer, Korb, all of, Germany, assignors to Andreas Stihl, Maschinenfabrik, Waiblingen, Germany**

**Filed Feb. 10, 1969, Ser. No. 798,096**
**Claims priority, application Germany, Feb. 9, 1968, P 16 07 404.7**
**Int. Cl. B05b 9/08**
**U.S. Cl. 239—153** **8 Claims**



A portable plant treating apparatus, especially for spraying, dusting, and fog laying, which includes: a plurality of container means arranged adjacent to each other and connected to each other for respectively storing fuel and the plant treating substance to be discharged, fuel driven motor means arranged below said container means and having a crankshaft, blower means drivingly connected to and arranged below said motor means and having its axis of rotation is substantially axial alignment with said crankshaft, discharge conduit means communicating with said blower means and with the container means containing the plant treating substance, and strap-equipped carrier plate means connected to one of said container means for carrying the apparatus on the back of a person.

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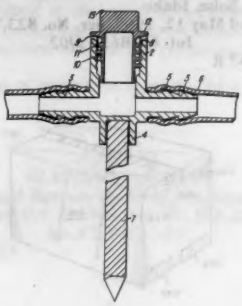
**3,586,239**
**IRRIGATION SPRAY UNIT**

**Ischajahu Blass, 26 Rehov Manneh, Tel Aviv, Israel**

**Filed Apr. 25, 1969, Ser. No. 819,313**
**Claims priority, application Israel, May 3, 1968, 29,926**
**Int. Cl. B05b 1/02**
**U.S. Cl. 239—276** **3 Claims**

An irrigation spray unit for use in irrigation and designed to ensure a low range spray of water therefrom with a low rate of supply unit being adapted to be coupled to an irrigation feed pipe in which the water flows at supply mains pressure, the unit serving to reduce the supply pressure to a very low level and to divide the incoming stream into a plurality of outflowing low range sprays.



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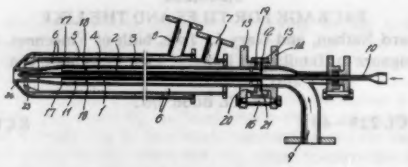
**3,586,240**
**BLOWING NOZZLE**

**Kazuo Konioka, and Takeshi Tada, both of Yohohama-shi, Kanagawa-ken, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 29, 1968, Ser. No. 780,003**
**Int. Cl. B05b 7/10**
**U.S. Cl. 239—402.5** **1 Claim**



An adjustable blowing nozzle comprising a central pipe through which fuel is fed, an outer pipe coaxially surrounding the central pipe through which an oxygen containing gas is fed under pressure, a plurality of flexible guide vanes extending in radial direction through the space between the central and the outer pipe, and means for adjusting the guide vanes between a position in which the same extends respectively in axial planes and a plurality of positions in which the guide vanes are twisted to a varying degree about the axis of the pipes to impart a whirling movement to the gas passing through the outer pipe. The outer pipe is preferably surrounded by a water jacket for cooling the blowing nozzle.

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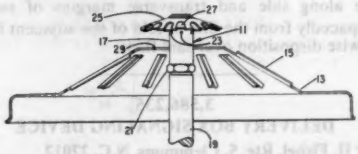
**3,586,241**
**FUEL BURNING APPARATUS**

**Hall Virgil, Brownsburg, Ind., assignor to Carrier Corporation, Syracuse, N.Y.**

**Filed Dec. 22, 1969, Ser. No. 886,931**
**Int. Cl. B05b 7/10**
**U.S. Cl. 239—406** **3 Claims**



A gaseous fuel burning assembly employing a burner having a plurality of horizontally disposed radial passages for

discharge of gas therefrom. A horizontally disposed, fluted circular plate above the passages is provided to spread the gas and provide a continuous ring thereof for mixture with combustion air passing through a cone-shaped air baffle in a vortex pattern.

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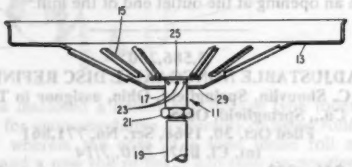
**3,586,242**
**FUEL BURNING APPARATUS**

**Lester G. Woolard, Brownsburg, and Keith V. Eisberg, Martinsville, both of, Ind., assignors to Carrier Corporation, Syracuse, N.Y.**

**Filed Dec. 22, 1969, Ser. No. 886,925**
**Int. Cl. B05b** *7/10*
**U.S. Cl. 239—406** **2 Claims**



A gaseous fuel burning assembly employing a burner head having a plurality of horizontally disposed radial passages for discharge of gas therefrom. A horizontally disposed circular plate above the passages is provided to spread the gas for mixture with combustion air passing through an inverted cone-shaped air baffle in a vortex pattern.

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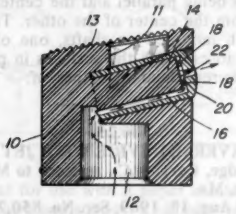
**3,586,243**
**TWO-PIECE DISPENSING BUTTON**

**Gerald D. Jones, West Hill, Ontario, Canada, assignor to Precision Valve (Canada) Limited, Ajax, Ontario, Canada**

**Filed Nov. 20, 1969, Ser. No. 878,365**
**Int. Cl. B05b** *1/34*
**U.S. Cl. 239—492** **6 Claims**



A two-piece actuating button suitable for use on pressurized dispensers or in conjunction with pump dispensers is provided with an aperture in the body piece which reveals a portion of the discharge orifice insert piece for visual information purposes. By making the two pieces of contrasting colors, the desired information appears in the aperture in contrasting color thereby eliminating the need for printing.

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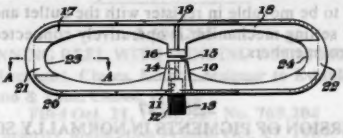
**3,586,244**
**IRRIGATION NOZZLES**

**Thomas William Johnson, 88 Oakcroft Gardens, Littlehampton, Sussex, England**

**Filed Mar. 21, 1969, Ser. No. 809,201**
**Int. Cl. B05b** *1/26*
**U.S. Cl. 239—524** **5 Claims**

An irrigation nozzle of the type having a jet adapted to be connected to water supply and provided with a delivery orifice through which a stream of water is delivered in use, and a planar deflection surface located in the path of the water stream with its plane at right angles to the axis thereof, wherein the jet and the deflection surface are rigidly connected by a pair of symmetrically disposed, outwardly extending U-shaped arms, the mid points of which are flattened relative to the remainder of the arms and spaced from the jet



by a distance sufficient to ensure a substantially uniform distribution of atomized water around the nozzle in use.

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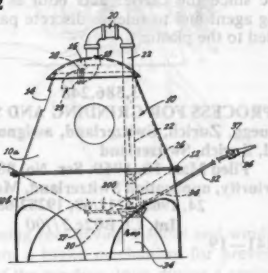
**3,586,245**
**AGRICULTURAL APPARATUS**

**Richard A. Carlyon, Jr., 1000 Sharrow Way, Carson City, Nev.**

**Filed July 10, 1969, Ser. No. 840,804**
**Int. Cl. A01c** *23/00*
**U.S. Cl. 239—662** **3 Claims**



Improved agricultural apparatus is provided which, for example, may be mounted on the back of a truck, or on a trailer, and which may be used conveniently and efficiently to mulch, fertilize and seed an area. The apparatus to be described includes a tank containing a slurry of the seed, mulch and fertilizer. A circulating pump is coupled to the tank for circulating the slurry through the tank, and a spray dispensing hose is coupled to the circulating line from the pump for receiving a portion of the circulating slurry to be sprayed thereby over the area.

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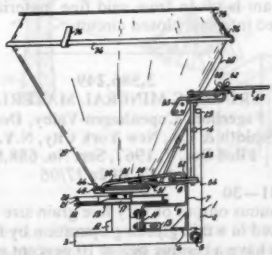
**3,586,246**
**SPREADING APPARATUS**

**Cornelis Van Der Lely, 7, Bruschenrain, Zug, Switzerland, and Ary Van Der Lely, 10, Weverskade, Maasland, Netherlands**

**Filed Dec. 20, 1968, Ser. No. 785,621**
**Claims priority, application Netherlands, Dec. 27, 1967, 6717660**
**Int. Cl. A01c** *17/00*
**U.S. Cl. 239—665** **10 Claims**



This invention relates to spreading implements of the kind comprising a frame movable over the ground, a container for

material to be spread, at least one outlet port through which material from the container can reach the spreading member. One or more flow control members are positioned below the container to be movable in register with the outlet and an adjusting or setting mechanism is operatively connected to the flow control members.

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**3,586,247**

## DISPERSION OF PIGMENTS IN NORMALLY SOLID CARRIER MEDIA

**Lyle Eugene Perrins, St. Albans, England, assignor to Imperial Chemical Industries, Limited, London, England**

**Filed May 8, 1968, Ser. No. 727,733**
**Claims priority, application Great Britain, May 12, 1967, 22186/67**
**Int. Cl. B02c** *19/12*
**U.S. Cl. 241—16** **6 Claims**

Grinding a mixture of pigment and a carrier for the pigment at a temperature above the melting point of the carrier which is normally solid at room temperature. The dispersed product of such process is particularly suited for use in coloring plastic since the carrier acts both as an agglomeration preventing agent and to release discrete particles of pigment when added to the plastic.

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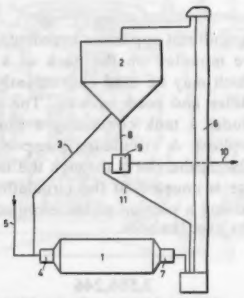
**3,586,248**

## PROCESS FOR GRINDING AND SIFTING

**Rudolf Ruegg, Zurich, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland**

**Filed Mar. 10, 1969, Ser. No. 805,752**
**Claims priority, application Switzerland, Mar. 21, 1968, Dec. 24, 1968, 4211/68; 19282/68**
**Int. Cl. B02c** *21/00*
**U.S. Cl. 241—19** **4 Claims**



A process for grinding and sifting a granular material, more particularly cement, comprises grinding the charge material stream and thereupon sifting the ground material stream and dividing the latter into a coarse material stream and a fine material stream, and said course material stream into said charge material stream, a closed circuit of coarse material thus being formed, and said fine material stream forming the finished product. According to the invention, a partial stream is taken from said fine material stream and is reintroduced into said closed circuit.

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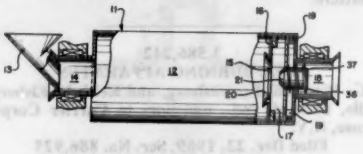
**3,586,249**

## GRINDING MINERAL MATERIALS

**Gunnar R. Fagerholt, Copenhagen-Valby, Denmark, assignor to F. L. Smidth & Co., New York City, N.Y.**

**Filed Dec. 7, 1967, Ser. No. 688,859**
**Int. Cl. B02c** *17/06*
**U.S. Cl. 241—30** **2 Claims**

A continuous output of very fine grain size mineral material is obtained in a mill grinding operation by initially grinding material to have a residue below 10 percent on a 210-micron screen, then further grinding the material by means of grinding bodies having a maximum middle or average weight of less than 15 grams until a product of a fineness below 1 percent on a 210-micron screen is obtained and then the



product is passed out of the mill by gravity or overflow through an opening at the outlet end of the mill.

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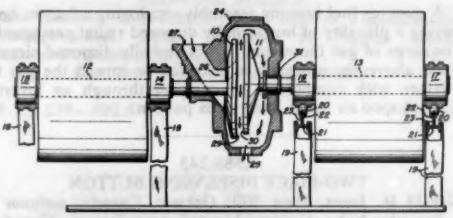
**3,586,250**

## ADJUSTABLE NONCOAXIAL DISC REFINER

**Joseph C. Shouvlin, Springfield, Ohio, assignor to The Bauer Bros. Co.,, Springfield, Ohio**

**Filed Oct. 30, 1968, Ser. No. 771,861**
**Int. Cl. B02c** *7/10, 7/14*
**U.S. Cl. 241—252** **10 Claims**



A disc refiner including opposed refining surfaces at least one of which rotates relative the other, characterized by said opposed surfaces being parallel and the center of one being radially offset from the center of the other. The disc refiner surfaces are each mounted on shafts, one of which shafts being adjustable to establish the surfaces in parallelism and to produce the desired radial offset thereof.

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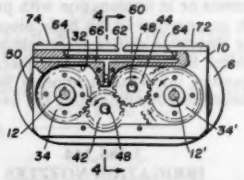
**3,586,251**

## BELT TRAVERSE DEVICE WITH JET MEANS

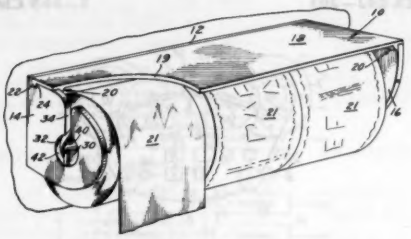
**Sam Wesley Burdge, Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.**

**Filed Aug. 18, 1969, Ser. No. 850,761**
**Int. Cl. B65h** *54/28*
**U.S. Cl. 242—43** **4 Claims**



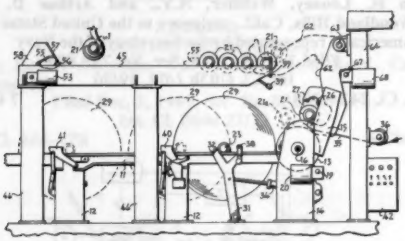
A traverse device having a pair of counterrotating endless belts laced about spaced, offset pulleys providing linear belt spans lying in intersecting planes. The belts are adapted to circulate a plurality of traverse guides in counter, bypassing paths for reciprocably traversing a continuous strand or yarn in a winding operation. Fluid pressure jet means provide a flow of pressurized air to impinge upon and deflect the yarn in the reversal zones for effecting a positive, controlled transfer of the yarn from one traverse guide to another.

3,586,252
**TOILET TISSUE DISPENSER**
Percival R. Sutton, 9429 Cedartree Road, Downey, Calif.
Filed June 19, 1969, Ser. No. 834,800
Int. Cl. A47k *10/22, 10/32*
U.S. Cl. 242—55.3 1 Claim



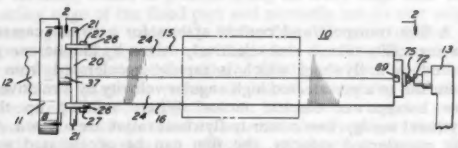
There is disclosed a holder and storage type toilet tissue dispenser for accommodating a plurality of tissue rolls of the character wherein the core of a used tissue roll may be removed and a new roll of tissue can then be positioned for use without removing any portion of the dispenser. The dispenser comprises a lid or cover supported by a base support plate and sidewalls extending therefrom, each sidewall being adapted to support a movable support arm, whereon toilet tissue rolls are positioned.

3,586,253
**REEL LOADER FOR PAPER MACHINES OR THE LIKE**
LeRoy F. Gilbank, Beloit, Wis., and Raymond J. Tangye, Roscoe, Ill., assignors to Beloit Corporation, Beloit, Wis.
Filed Feb. 6, 1969, Ser. No. 797,138
Int. Cl. B65h *17/06, 19/06*
U.S. Cl. 242—65 9 Claims



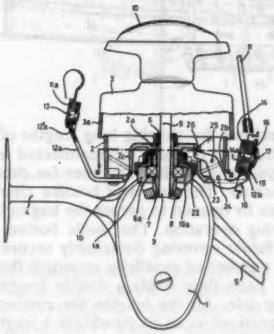
A reel loader for use with a paper machine or the like is adapted to receive and support a plurality of empty horizontally disposed reels and to load successive ones thereof into a self-threading reel-winding apparatus in properly timed relation to the operation thereof.

3,586,254
**ADJUSTABLE MANDREL**
Francis J. McCabe, P.O. Box 131, Penns Park, Pa.
Filed June 10, 1969, Ser. No. 831,910
Int. Cl. B65h *75/24*
U.S. Cl. 242—72.1 9 Claims



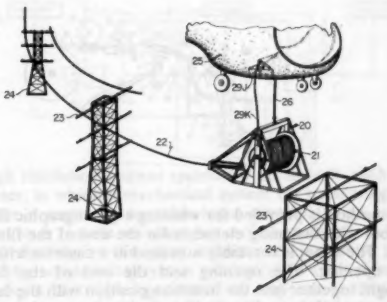
An adjustable mandrel is provided particularly suited for winding square or rectangular coils of wire, the mandrel having elongated angle corner elements with interior cammed actuation selectively actuated from one end of the mandrel for size adjustment and for retraction for coil removal.

3,586,255
**SPINNING REEL WITH WINDING DRUM BRAKE**
Pierre Monthulet, Cluses, France, assignor to Etablissements Carpano & Pons, Cluses, France
Filed Oct. 21, 1968, Ser. No. 769,204
Claims priority, application France, Oct. 27, 1967, 126,082
Int. Cl. A01k *89/00*
U.S. Cl. 242—84.21 7 Claims



A compact spinning reel having a spool and winding drum is disclosed wherein a brake mechanism for preventing undersired rotation of the winding drum during a casting operation is disposed within a housing provided in the winding drum. The brake mechanism comprises a toothed braking member cooperative with a pivotally mounted lever to effectively lock the winding drum against rotation during a casting operation by the user. A line pickup is mounted on the winding drum for movement to a line retrieval position and a line casting position and functions to actuate the brake mechanism when in the latter position.

3,586,256
**HIGH-TENSION-WIRE-LAYING DEVICE FOR USE WITH HELICOPTERS**
Bertie William Wellman, P.O. Box 36, Schriever, La.
Filed Jan. 19, 1970, Ser. No. 3,923
Int. Cl. B65h *75/40, 59/38*
U.S. Cl. 242—86.7 6 Claims



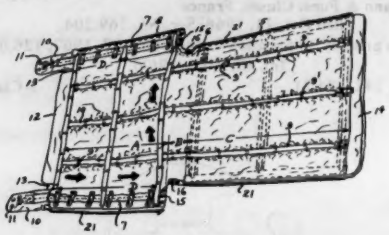
The present device relates to an apparatus for transporting and regulating slack in wire wound on reels and employed in laying high tension lines through swamps and marshes by use with a helicopter as the transporting vehicle.

3,586,257

## BAG FOR EXTRACTION LINE DEPLOYMENT

George A. Zelinskas, Dayton, Ohio, assignor to the United States of America as represented by the Secretary of the Air Force

Filed Jan. 21, 1970, Ser. No. 4,642
Int. Cl. B65h 49/00
U.S. Cl. 242—129 7 Claims



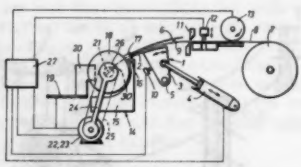
A bag is disclosed for stowing long lengths of woven rope arranged in the form of short interconnected lengths which can be deployed in an orderly manner for dropping equipment by parachute. The bag is of boxlike character having sides which can be opened to permit the bag to lie flat during the rope-stowing operation. The inside bottom face is provided with a fabric covering detachably secured to the bag and having a number of parallelly arranged flutes, sewed in the covering. Each flute holds a double length of rope arranged side-by-side. All the lengths are connected together by end loop portions so as to constitute a single line. Additional rope-containing flutes can also be provided on the inside top cover of the bag while it is lying flat, and so-called "leaves" or partitions can, in addition, be provided over the first tier with a fluted fabric covering to constitute a second tier or layer. The bag can be modified slightly to accommodate lengths of wide webbing formed of a number of thicknesses held together by permanent straps. The webbing is stowed in a zigzag manner, across and lengthwise of the bag and temporarily held in place by the tie cords which are successively broken as the webbing being payed out of the bag by the pull of the parachute.

3,586,258

## METHOD OF AND AN APPARATUS FOR WINDING A PHOTOGRAPHIC FILM IN TAPE FORM ONTO A SPOOL ARRANGED INSIDE A CASSETTE

Oskar Horlezeder, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 22, 1969, Ser. No. 818,310
Claims priority, application Germany, Apr. 27, 1968, P 17 72 319.2
Int. Cl. G11b 23/10; B65h 75/28
U.S. Cl. 242—197 11 Claims



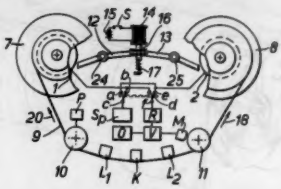
A method is provided for winding a photographic film into a spool with fastening elements for the end of the film on its core. The spool is rotatably mounted in a cassette with a slot-like opening. The opening and the end of the film are brought together into the insertion position with the fastening element on the spool core aligned with the opening. A guide tongue is then inserted within the slot and the end of the film is introduced into it and through the opening into contact and securement with the spool core. Then the guide tongue is withdrawn and a suitable length of the film is wound on the spool.

3,586,259

## DRIVE ASSEMBLY FOR MAGNETIC TAPE RECORDER

Hubert Richt, Socking, Germany, assignor to Suddeutsche Mechanische Werkstatten Wolf Freiherr von Hornstein KG, Barmseestr. 11, Munich, Germany

Filed July 7, 1969, Ser. No. 839,181
Int. Cl. B11b 15/32; G03b 1/04
U.S. Cl. 242—203 9 Claims



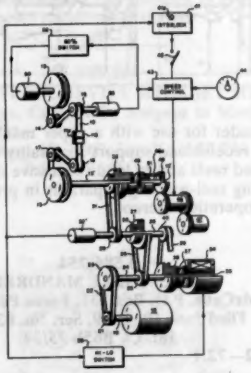
In a drive assembly for magnetic tape recorder a separate motor is associated with each of the reels. The motors are reversible so that the tape can be driven bidirectionally. An automatic control system maintains the constancy of the tape motion at any speed by monitoring the actual tape speed and comparing it with the nominal value thereof. Upon detection of a difference between the two data a servo loop is actuated to correct the deviation of the actual from the nominal speed. Adequate tension of the tape is maintained at all times.

3,586,260

## FILM TRANSPORT AND CONTROL FOR STREAK CAMERA

John H. Looney, Webster, N.Y., and Arthur D. Clay, Woodland Hills, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed July 10, 1968, Ser. No. 743,829
Int. Cl. G03b 1/04, 39/00
U.S. Cl. 242—208 7 Claims

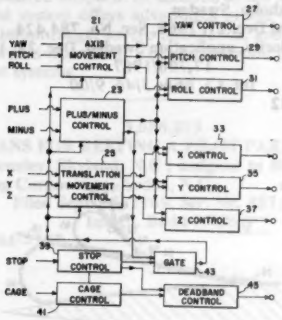


A film transport and control system for a streak camera having a film takeup reel selectively driven by kinetic energy stored in a flywheel which is rapidly accelerated from a standstill to a preselected high angular velocity by a relatively low horsepower electric motor. When building up the flywheel energy, two motor-to-flywheel ratios are utilized. At the preselected velocity, the film can be accelerated and maintained at a preselected speed by an electromagnetic clutch between the flywheel and takeup reel. A brake on the supply reel critically dampens the system hen the film reaches approximately 80 percent of the preselected speed.

## 3,586,261
## VOICE OPERATED CONTROLLER

T. O. Paine, Acting Administrator of the National Aeronautics and Space Administration in respect to an invention of David N. Lovinger, Minnetonka, Minn.

Filed Feb. 27, 1969, Ser. No. 802,948
Int. Cl. B64g *1/00*; B64c *13/04*
U.S. Cl. 244—1 9 Claims

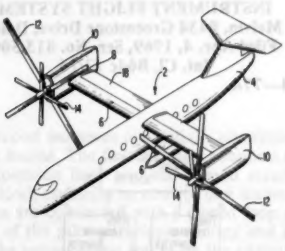



This disclosure describes a voice operated controller for controlling the reaction jets of a space vehicle. A voice recognition apparatus is connected to a control. The control is connected to, and controls, the reaction jets. The voice recognition apparatus generates pulses in accordance with received voice commands. These pulses are applied to the control which interprets them. The control then applies suitable control signals to the reaction jets so that the desired command is carried out.

## 3,586,262
## FOREFLAPPED AIRFOIL

Irving Robert Sherman, 1134-D Haverford Road, Crum Lynne, Pa.

Filed Dec. 5, 1969, Ser. No. 882,649
Int. Cl. B64c *27/52*
U.S. Cl. 244—7R 6 Claims

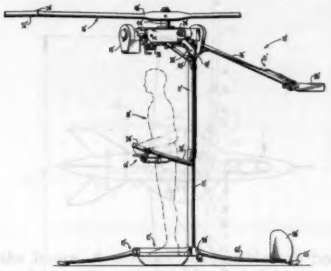


An airfoil for an aircraft capable of both vertical and horizontal flight has a forward fixed part, a flap part constituting the rear portion, and an auxiliary lower surface part, or foreflap, which is pivoted along its front edge near the leading edge of the fixed part and normally has its rear edge close against the under side of the flap. When the aircraft is in vertical flight, the rear flap and the foreflap extend downward and, together with the fixed part, form a rounded and faired shape to reduce download caused by the slipstream of rotors or propellers. At intermediate angular positions the rear flap, the foreflap, and the fixed part form a thick airfoil having an effective incidence angle to the fuselage to provide sufficient lift for transitional low speed flight. When the rear flap and foreflap are fully retracted, they and the fixed part form a normal airfoil suitable for high-speed forward flight.

## 3,586,263
## KINESTHETICALLY CONTROLLED HELICOPTER

Peter R. Payne, 12221 Parklawn Drive, Rockville, Md.

Continuation-in-part of application Ser. No. 711,742, Mar. 8, 1968, now abandoned. This application Jan. 3, 1969, Ser. No. 798,569
Int. Cl. B64c *25/10*, *27/50*
U.S. Cl. 244—17.17 10 Claims

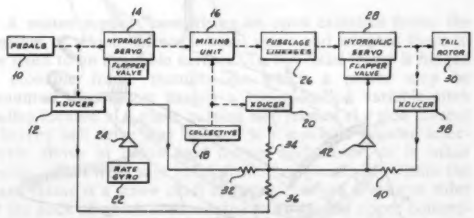


A kinesthetically controlled helicopter has a lightweight platform for supporting a man and handlebars with controls. A single rotor restrained by a stiff hinge has foldable rotor blades which are driven by a motor with appropriate gearing. The rotor may be arranged above the platform or below the platform. The position of the blade will dictate the particular elements that are folded. A tail rotor on a tail boom is controlled from the handlebars as is the motor. A landing gear includes foldable legs. The helicopter may thus be foldable into a compact structure and is lightweight enough for manual portability.

## 3,586,264
## HIGH RESOLUTION CONTROL SYSTEM

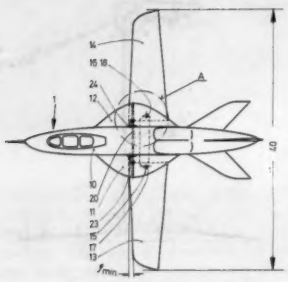
Edward S. Carter, Jr., Fairfield, and Dean E. Cooper, Trumbull, both of, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Nov. 7, 1968, Ser. No. 774,127
Int. Cl. B64c *27/82*
U.S. Cl. 244—17.19 10 Claims




A high resolution control system for an aircraft, such as a helicopter, in which a mechanical system for translating motion from a manually operable input member to an output member at a remote location has a first mechanical input supplied directly by the input member and a second input supplied by an electrical system producing an error signal by comparing a first signal generated in response to displacement of the input member with a feedback signal generated in response to displacement of the output member. Where the output member is a helicopter tail rotor, means are provided for introducing rate-of-turn and collective pitch corrections into both the mechanical system and into the electrical system.

**3,586,265**
**PIVOT DRIVE FOR AN AIRCRAFT HAVING A VARIABLE GEOMETRY**
**Gero Otto Madelung, Munich, Germany, assignor to Entwicklungsring Sud, GmbH, Munich, Germany**
**Filed Jan. 30, 1969, Ser. No. 795,312**
**Claims priority, application Germany, Feb. 28, 1968, P 15 56 398.1**
**Int. Cl. B64c** *3/40*
**U.S. Cl. 244—46** **4 Claims**



A pivot drive for adjusting the sweepback of each of the wings of a jet aircraft in a simultaneous uniform manner. The base of each of the wings is pivotally mounted to a wing stub secured to each side of the aircraft fuselage. A pair of driving motors are mounted upon the wing stubs adjacent the sides of the fuselage and are drivingly coupled by means of a gear train to a drive shaft. The drive shaft passes through the fuselage. The ends of the drive shaft are coupled to a spindle gear by means of a cardan joint. The nuts of the spindle gear are pivotably connected to the base of the wing.

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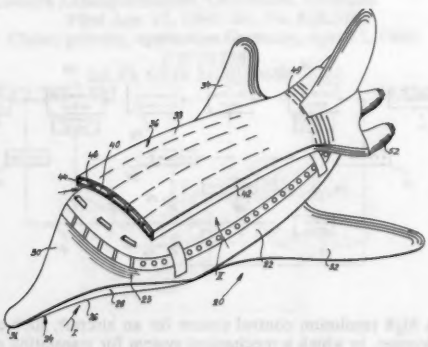
**3,586,266**
**JET PROPELLED AIRCRAFT WITH AUXILIARY LIFTING MEANS**
**Paul Bucher, 68-19 31st Ave., Jackson Heights, N.Y.**
**Filed Sept. 24, 1968, Ser. No. 761,976**
**Int. Cl. B64c** *1/26, 3/06*
**U.S. Cl. 244—36** **1 Claim**



A wing is mounted on top of the streamlined body of a jet propelled aircraft. The wing has a plurality of channels therethrough. Air flowing through the wing provides lift for the body supplementing the lift of the lateral wings, so that the lateral wings can be made smaller. A shorter runway will be required for takeoff and landing and a slower landing speed is made possible. The aircraft will be able to fly at higher maximum speed. The wing may be provided with movable flaps in the several channels for use in braking the aircraft while landing. The channels can feed air directly to the jet engines of the aircraft to improve draft and conserve fuel. An aircraft can be provided with a nose shaped like a duck's bill to provide still further lift in cooperation with the multichanneled wing.

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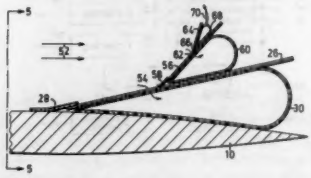
**3,586,267**
**ARRANGEMENT IN AND RELATING TO AIRCRAFT**
**Alf Martin Magnus Ingelman-Sundberg, Smedsbacksgatan 5 115 39, Stockholm, Sweden**
**Filed Dec. 17, 1968, Ser. No. 784,424**
**Claims priority, application Sweden, Dec. 22, 1967, 17,700/1967**
**Int. Cl. B64c** *3/46, 9/00*
**U.S. Cl. 244—42** **6 Claims**



A device for regulating the setting angle of a control surface such as a flap or rudder on an aircraft comprising an inflatable bag located between the control surface and the fuselage. Air for inflating the bag is drawn from outside the aircraft at a location where increased pressure due to dynamic pressure of the passing airstream is available. The control surface and the bag may be provided with coinciding openings therein, and a secondary flap is mounted on the control surface immediately behind said openings as viewed in the direction of the airstream. The secondary flap when raised from the control surface creates a pressure rise at the openings, thus pressurizing the openings and thereby also the interior of the bag leading to actuation of the main control surface in servo fashion.

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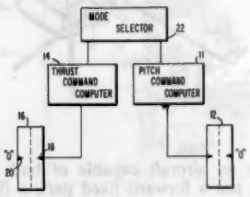
**3,586,268**
**INSTRUMENT FLIGHT SYSTEM**
**William W. Melvin, 8434 Greenstone Drive, Dallas, Tex.**
**Filed Apr. 4, 1969, Ser. No. 813,500**
**Int. Cl. B64c** *13/16*
**U.S. Cl. 244—77A** **14 Claims**




An aircraft control system particularly useful during approach operations. In the approach mode, a pitch command computer produces a pitch command signal for controlling an aircraft's pitch to maintain a desired angle of attack, and hence a desired airspeed; and a thrust command computer produces a thrust command signal for controlling the flight path angle to maintain an aircraft on a desired glide path for landing. The command signals control either instrument indicators which visually display the appropriate information to the pilot for manual operation or alternatively control an autopilot and autothrottle for automatic operation of the air-

craft. If the aircraft is below the desired glide path but at the desired airspeed, athrust command computer indicates the direction necessary to change the thrust to increase the aircraft's flight path angle so that the aircraft returns to the glide path. As the thrust level is varied according to the thrust command signal, an angle of attack sensor senses the changes in the angle of attack of the aircraft and a pitch command computer produces a pitch command signal to maintain the angle of attack at a desired level determined from the desired airspeed. In addition to the approach mode, the control system offers advantages in the take off, climb, hold, maximum range, severe turbulence, and descent modes of an aircraft's operation. The cruise mode operates similar to prior art systems.

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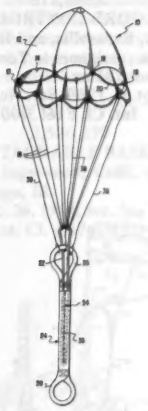
**3,586,269**

**MEANS FOR REEFING A PILOT PARACHUTE**

**Eugene Hensley, Skyland, N.C., assignor to Stencel Aero Engineering Corporation, Arden, N.C.**

**Filed Sept. 15, 1969, Ser. No. 857,917**
**Int. Cl. B64d** *17/36*
**U.S. Cl. 244—152** **6 Claims**



First and second members are initially connected together by a frangible means. The first member connects to the pilot parachute suspension lines and the second member, which attaches to a load, connects to control line means. The control line means are connected with a closed loop attached at the periphery of the pilot parachute canopy and are initially slack. When the aerodynamic forces on the canopy cause the first and second members to move relatively to one another, thereby breaking the frangible means, the control line means are pulled taut thus exerting a force on the closed loop which, in turn, reefs the canopy.

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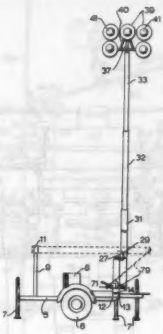
**3,586,270**

**MULTIPLE STAGE EXTENSIBLE BOOM**

**Erich W. Loffler, and Hans Kruger, both of Redwood City, Calif., assignors to Electro-Motion Pacific, Inc., Redwood City, Calif.**

**Filed Nov. 12, 1968, Ser. No. 774,850**
**Int. Cl. F21p** *5/00*
**U.S. Cl. 240—3** **4 Claims**

An extensible boom for portable lights has a two-part base. One part of the base is fixed to a trailer or other vehicle and the other part is rotatable with respect thereto about a vertical axis. Hinged to the rotatable part about a horizontal axis is a telescopic multisection boom. A first winch elevates the boom from horizontal to vertical position. A second winch controls a cable system located inside the boom sections to



elevate the boom. A manually extensible top boom section may be used to increase the maximum height.

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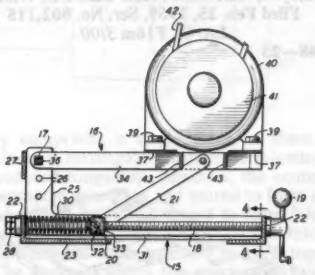
**3,586,271**

**MOTOR SUPPORT WITH SPRING BALANCING CONTRA TO MOTOR WEIGHT**

**Jerome James Sloyan, c/o Automatic Motor Base Co., Windsor, N.J.**

**Filed May 5, 1969, Ser. No. 821,653**
**Int. Cl. F16m** *1/00*
**U.S. Cl. 248—13** **9 Claims**



A motor support comprising an open cratelike frame the bottom of which defines a basal plane and adapted there to be fixed to an available surface. To this fixed frame is hinged a movable frame member on which a motor may be mounted, the motor having a spring-loaded variable-pitch pulley located in a plane passing said frames at a side thereof whereby belt drive may be used to a machine situated selectively above or below said frames and motor, or in other words, offset from said basal plane. Longitudinally within the fixed frame is a screw shaft engaging through a yoke or rider at the ends of which are swinging struts having upper connection to the movable frame for rising and lowering the same. Springs are provided for said yoke to compensate for the weight of the motor.

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**3,586,272**

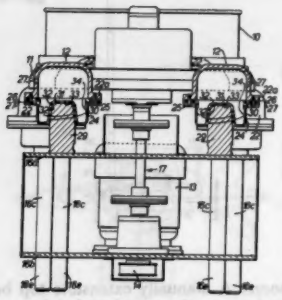
**RESILIENT MOUNTING ASSEMBLIES**

**Kenneth Pestell, Rye, Sussex, England, assignor to The Rother Iron Works Limited, Rye, Sussex, England**

**Filed Aug. 20, 1969, Ser. No. 851,600**
**Claims priority, application Great Britain, Sept. 5, 1968, 42168/68**
**Int. Cl. F16f** *15/00*
**U.S. Cl. 248—22** **5 Claims**

A resilient mounting assembly adapted for use in mounting a vibratory frame relative to a supporting frame in vibratory

apparatus comprises a generally rigid cup-shaped member and a generally flexible cup-shaped member which is open towards the rigid member and cooperates with the rigid



member to define therewith an airtight space containing air under pressure to provide said flexible member with resilience.

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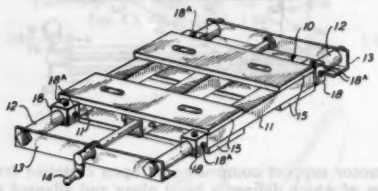
**3,586,273**
**MOTOR BASE WITH NONLUBRICATED SLIDING CARRIAGE**
**Jerome J. Sloyan, Automatic Motor Base Co., Windsor, N.J.**
**Filed Feb. 25, 1969, Ser. No. 802,115**
**Int. Cl. F16m *3/00***
**U.S. Cl. 248—23** **4 Claims**



At least two square housing tubes on respective round rails with intervening thermoplastic gliders at opposite end regions of the tubes, each glider being a form-fit with its respective square tube and round rail, rendering the gliders nonchattering on the rails, and nonrotatable in the tubes and longitudinally slidable on the rails with a minimum of friction without lubrication, and the assembly of each tube and its rail having means for retaining the gliders in their appointed longitudinal locations within their respective tube.

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**3,586,274**
**FISHING POLE SUPPORT**
**Wayne H. Hart, 7342 Walnut Street, Buena Park, Calif.**
**Filed Apr. 11, 1969, Ser. No. 815,381**
**Int. Cl. A01k *47/10, 87/00***
**U.S. Cl. 248—44** **2 Claims**

A fishing pole holder comprising an elongated rod, one portion of which is formed into a continuous series of coils, and the remainder of which forms a spike adapted to be inserted in the ground. The series of coils provides a generally cylindrical opening for receiving the handle of the fishing pole. The pole may be positioned at any one of an infinite

number of angular positions by resting the base of the handle on different ones of the coils.

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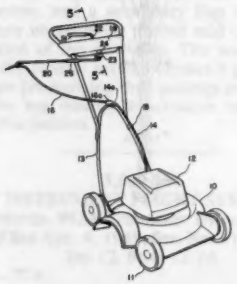
**3,586,275**
**CORD CONTROL**
**Robert A. Mittelstadt, Burnsville, and Heinrich F. Tetzlaff, St. Paul, both of, Minn., assignors to Toro Manufacturing Corporation, Minneapolis, Minn.**
**Filed Sept. 4, 1968, Ser. No. 757,254**
**Int. Cl. F16l *3/00***
**U.S. Cl. 248—52** **2 Claims**



A device for moving the electric cord of an electric lawn mower from one side of the mower to the other which includes an elongate swingable arm which swings in a plane transverse to the direction of travel of the mower and which has the cord supported by the outer end thereof, said arm having a swingable handle attached thereto which also swings in a transverse plane and which is manipulatable by the operator to effect the swinging movement of the cord-carrying arm, the arm being of sufficient length so that it not only moves the cord from one side of the mower to the other, but also flips it aside a substantial distance ahead of the mower so that the entire path of the next swath to be cut is totally free of cord.

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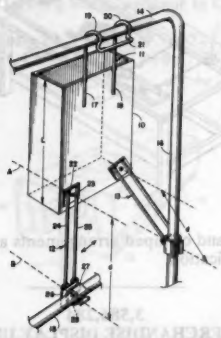
**3,586,276**
**SUPPORTING STRUCTURE AND BASKET**
**Richard A. O'Mahoney, Burbank, Calif., assignor to Velcor**
**Filed July 1, 1969, Ser. No. 838,183**
**Int. Cl. A47k *1/04***
**U.S. Cl. 248—128** **3 Claims**

A basket is provided with an upper hook secured to its rear portion and first and second elongated lower clip means pivoted adjacent to the lower left and right corners of the basket. These first and second clip means are in the form of

baseplates pivoted to the corner portions and extending to terminate in free ends in resilient clips such that the same may be swung in a plane parallel to the plane of the rear of the basket. The arrangement is such that the upper hook may



readily be positioned about a horizontal tubular frame structure and the lower clips positioned spatially to engage other tubular members of the frame structure to stabilize the position of the basket. Such frame structures may constitute bedside rails in hospitals or portable walkers for crippled people.

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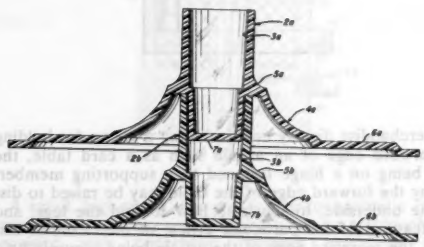
**3,586,277**
**STACKABLE BASE**

**Arthur A. Voris, Jr., Ingelwood, Calif., assignor to Standard Oil Company, Chicago, Ill.**

**Filed Dec. 26, 1968, Ser. No. 787,119**
**Int. Cl. A47g** *23/02*
**U.S. Cl. 248—146** **5 Claims**



The invention disclosed herein is a base for a plastic container or the like which can be stacked with at least one other base by means of a male-female connection between the bases.

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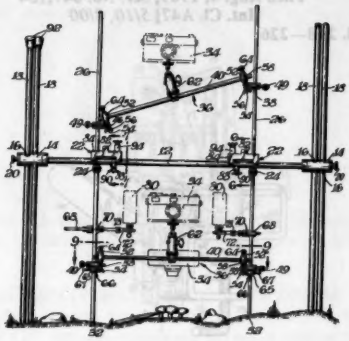
**3,586,278**
**ARTICLE SUPPORT**

**Donald M. Simons, 2209 Centerville Road, Wilmington, Del.**

**Filed Jan. 21, 1969, Ser. No. 792,251**
**Int. Cl. F16m** *11/32*
**U.S. Cl. 248—165** **20 Claims**

An article support particularly adapted for holding a camera and accessory equipment includes a pair of parallel ways supported in a horizontal plane above the ground or other bearing surface by a pair of legs at each end thereof. The legs of each pair are secured at an appropriate angle to each other and at right angles to the median longitudinal axis of the ways. All legs are independently adjustable, the vertical component of adjustment permitting compensation for any deviations of the bearing surface from a smooth, horizontal plane. A pair of substantially vertical rods, vertically adjustable, are secured to and between the ways and also rest upon the bearing surface with articles being supported



secured on adjustable mounting devices connected to the rods.

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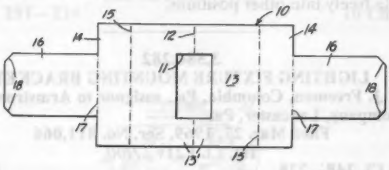
**3,586,279**
**ONE-PIECE COLLAPSIBLE PRODUCT-SUPPORTING DISPLAY**

**Gerald J. Benson, 216-16 85th Ave., Queens Village, N.Y.**

**Filed Mar. 26, 1969, Ser. No. 810,679**
**Int. Cl. A47b** *97/00*
**U.S. Cl. 248—174** **1 Claim**



A display comprising a single piece of sheet material, shaped to form a rectangular section, terminating at ends thereof in reduced tonguelike members, the central portion of the section being apertured and scored to form a product- or article-supporting body and scored to form foldable bottom wall parts, with said tonguelike members foldable with respect to the bottom wall parts and secured together and adapted to be disposed within the aperture of said body to aid in support of an article mounted in the display.

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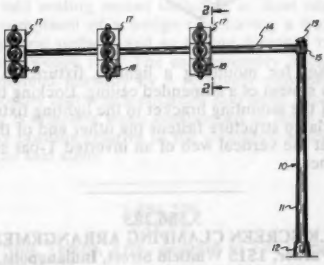
**3,586,280**
**SIGNAL MASTARM BRACKET**

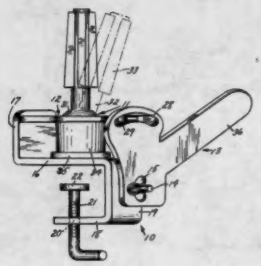
**Alfred P. Parduhn, 1924 Plymouth Lane, Oklahoma City, Okla.**

**Filed July 13, 1970, Ser. No. 54,162**
**Int. Cl. F16m** *13/02*
**U.S. Cl. 248—214** **4 Claims**



A mastarm bracket for signal lights which is vertically and laterally adjustable while maintaining a selected position on a column support.

**3,586,281**
**WIG BLOCK HOLDER**
**Louis Schumer, 5402 Beverly Road, Brooklyn, N.Y.**
**Filed Aug. 4, 1969, Ser. No. 847,154**
**Int. Cl. A47j** *5/10, 8/00*
**U.S. Cl. 248—226** **3 Claims**



An improved block holder capable of securely affixing a mannequin head form to a tabletop and for rotatably varying the position of the head form by means of a handle. The holder comprises four separable parts, a clamping device to be secured to the edge of a table, a ball socket connection provided with a standard receivable in a recess in the head block, a pressure plate which rests on the ball and slidably interconnects and is activated by a handle. Movement of the handle in a downward position locks the ball in position whereas upward movement of said handle permits the ball to rotate freely into other positions.

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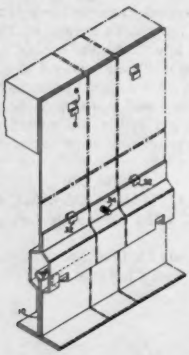
**3,586,282**
**LIGHTING FIXTURE MOUNTING BRACKET**
**Earl J. Freeman, Columbia, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.**
**Filed Mar. 27, 1969, Ser. No. 811,066**
**Int. Cl. F21v** *17/00*
**U.S. Cl. 248—228** **1 Claim**



A bracket for mounting a lighting fixture on the grid suspension system of a suspended ceiling. Locking tabs fasten one end of the mounting bracket to the lighting fixture, and a two-part clamp structure fastens the other end of the mounting bracket the vertical web of an inverted T-bar suspension grid member.

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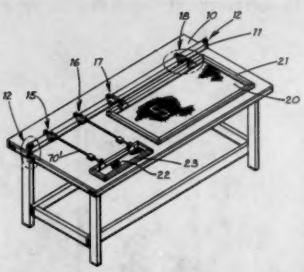
**3,586,283**
**SILK SCREEN CLAMPING ARRANGEMENT**
**Eddie R. Parker, 1515 Winfield Street, Indianapolis, Ind.**
**Filed Feb. 6, 1969, Ser. No. 797,089**
**Int. Cl. E05d** *5/02*
**U.S. Cl. 248—229** **9 Claims**

Clamping apparatus including two sets of clamping jaws which are hinged together. The clamping jaws may be disassembled and connected together in various ways to permit



various hinged and clamped arrangements as disclosed in the following specification.

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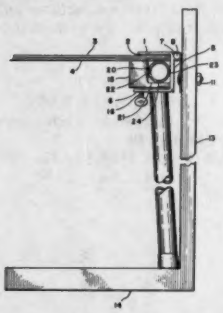
**3,586,284**
**MERCHANDISE DISPLAY UNIT**
**Elmer L. Riebold, 1020 Harrison Street, Park Ridge, Ill.**
**Filed Mar. 4, 1970, Ser. No. 16,426**
**Int. Cl. A47f** *5/00*
**U.S. Cl. 248—316R** **5 Claims**



A merchandise display unit including a clamp for holding the rearward edge of an article such as a card table, the clamp being on a hinge fastened to a supporting member, whereby the forward edge of the table may be raised to display the underside, to illustrate how to fold the legs, and other features of the particular article of merchandise displayed, the rearward edge of the article being securely held by the clamp hinged to the supporting member to permit hinged upward and downward movement of the merchandise being displayed.

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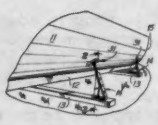
**3,586,285**
**BOAT BLOCK**
**Frank J. Modzelewski, 36 Union Avenue, Center Moriches, N.Y.**
**Filed July 8, 1969, Ser. No. 839,830**
**Int. Cl. B63c** *5/02*
**U.S. Cl. 248—354S** **8 Claims**



A boat block for supporting the sloping sides of a boat which can be used in any one of at least two positions to

change the height of the boat hull contacting member above the keel-supporting block so that the boat block can support a variety of boat hulls of various shapes.

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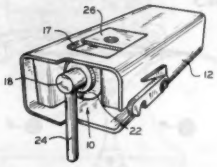
**3,586,286**
**RETRACTABLE LATCH MECHANISM**
**Robert A. Pratt, Harbert, Mich., assignor to Clark Equipment Company**
**Filed July 12, 1968, Ser. No. 744,372**
**Int. Cl. B65j 1/22; B60p 7/08**
**U.S. Cl. 248—361** **7 Claims**




A retractable latching mechanism having a body member pivotally mounted on a frame member to pivot between a latching position and a retracted position, a pintle member extending through an opening in the body member and having a latch portion on one end thereof, and a handle connected to the other end of the pintle member.

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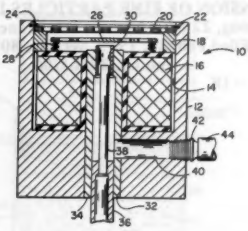
**3,586,287**
**ELECTROPNEUMATIC VALVE**
**Max Knobel, 453 Beacon Street, Boston, Mass.**
**Filed Apr. 11, 1969, Ser. No. 815,456**
**Int. Cl. F16k 31/06**
**U.S. Cl. 251—24** **6 Claims**




A small, high-speed, low-power electropneumatic valve is provided for various control applications. An electrical coil is provided with concentric passages extending axially therethrough. A magnetically responsive flapper member is positioned at the discharge end of one of the passages and air flowing through the one passage and out the discharge end normally produces a vacuum in the other passage. Upon energization of the coil the member is closed so as to produce pressure in both passages. The second passage may be operatively connected to a pressure responsive device such as an air-actuated valve or the like.

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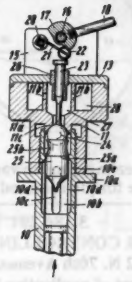
**3,586,288**
**SHUTOFF VALVE, ESPECIALLY FOR FLUSHING UNITS**
**Tore Gulich, Malmo, and Lennart Stigmark, Staffanstorp, both of, Sweden, assignors to Aktiebolaget Ifoverken, Bromolla, Sweden**
**Filed Oct. 9, 1969, Ser. No. 865,042**
**Claims priority, application Germany, Oct. 10, 1968, Mar. 27, 1969, P 18 02 219.0; P 19 15 572.7**
**Int. Cl. F16k 47/02**
**U.S. Cl. 251—120** **17 Claims**

A shutoff valve with a closure body which is moved by a fluid medium against a valve seat and which is adapted to be lifted off from the valve seat by an actuating member, especially for flushing devices in toilet installations, in which the closure member is connected to a fluid medium actuated plunger which is reciprocable in a cylindrical chamber with feeding passages in the inner surface thereof and which then moved in opening direction against the direction of the flow of fluid medium releases said feeding passages.



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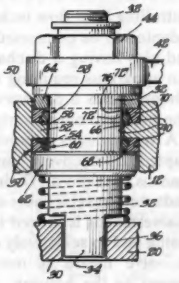
**3,586,289**
**VALVE UNIT AND STEM PACKING ASSEMBLY**
**Werner K. Priese, Tower Lake, Ill., assignor to Hills-McCanna Co., Carpentersville, Ill.**
**Filed Nov. 21, 1969, Ser. No. 878,606**
**Int. Cl. F16k 41/16**
**U.S. Cl. 251—214** **10 Claims**



A valve unit of the type including a body member having a passage therethrough and an aperture found therein transverse to said passage. A valve element disposed in said body for rotation between the valve-open and valve-closed positions by a stem extending outwardly of said body through said aperture. Sealing means for preventing leakage past said aperture, said sealing means including at least one packing assembly comprised of a wedge ring having a frustoconical inner peripheral surface, and an O-ring disposed radially inward of said wedge ring. The seal assembly is carried in a chamber defined partially by a relatively movable member and a stationary seat which encircles said stem, such that said wedge ring is effective when compressed to force the O-ring into sealing position relative to the clearance space between said seat and said stem.

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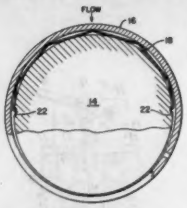
**3,586,290**
**VALVE**
**Robert A. Null, Tempe, Ariz., assignor to The Garrett Corp., Los Angeles, Calif.**
**Filed June 25, 1969, Ser. No. 836,357**
**Int. Cl. F16k 1/228; F16j 9/06**
**U.S. Cl. 251—306** **8 Claims**

This butterfly valve has a sealing ring expander on the side

which is disposed upstream when the valve is open to resist

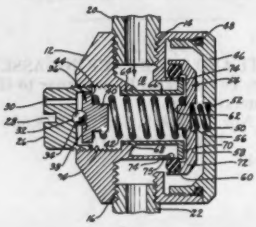


movement of the sealing ring toward the downstream side and thus reduces the torque required to close the valve.

### 3,586,291
### MEANS FOR CONTROLLING FLUID FLOW

Jerry P. Malec, 2832 N. 70th Avenue, Omaha, Nebr.

Continuation-in-part of application Ser. No. 752,829, Aug. 15, 1968. This application Feb. 24, 1969, Ser. No. 801,282
Int. Cl. F16k *31/163*
U.S. Cl. 251—324 5 Claims

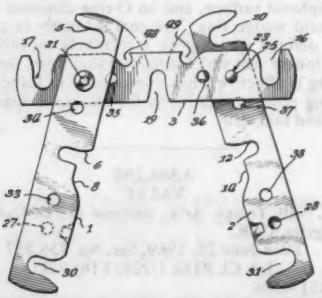


A means for controlling fluid flow including a housing having an inlet port adapted to be connected to a source of fluid under pressure and also having a discharge port adapted to be connected to an apparatus requiring controlled fluid flow or pressure. The housing has a passageway means provided therein between the inlet and outlet ports and is in communication therewith. A valve means is movably mounted in the housing and is adapted to selectively close the passageway at times. The valve means includes an O-ring movably mounted thereon which is adapted to selectively close the passageway means when the valve means is moved in one direction with respect to the housing and to selectively open the passageway means when the valve means is moved in an opposite direction with respect to the housing. A resilient means is also provided in the housing to normally bias the valve means in the said opposite direction.

### 3,586,292
### SPREADER AND SPACER FOR CABLE COMPONENTS

Leroy Buck, 243 S. Water Street, Ramsey, Ill.

Filed Feb. 26, 1969, Ser. No. 808,715
Int. Cl. B66f *3/00*
U.S. Cl. 254—131 4 Claims

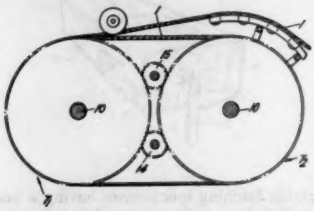


This invention is a device for spreading and spacing one or more components of a multicomponent cable in spaced-apart relation to each other.

### 3,586,293
### STRINGING OF CONDUCTORS

Walter Betta, Bergamo, Italy, assignor to C. R. F. Officine Meccaniche Di Precisione S.p.A., Milan, Italy

Continuation-in-part of application Ser. No. 491,358, Sept. 29, 1965, now Patent No. 3,381,938. This application Mar. 7, 1968, Ser. No. 711,452. Claims priority, application Italy, Sept. 29, 1964, 51,788/64
Int. Cl. E21c *29/16*
U.S. Cl. 254—134.3 4 Claims

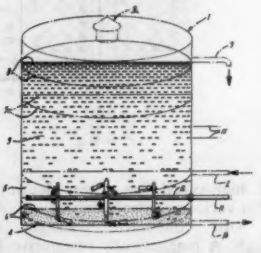


A device for balancing the tension in at least two conductors as they are fed out from feed drums comprising two braking drums each having at least one conductor passing thereover; a balanced hydraulic system having a pair of axles each connected to a corresponding drum; and a volumetric fluid pump connected to each axle. The fluid flow to each pump is controlled in order to brake the drums, and the fluid pressure is balanced by a balancing circuit in order to maintain equal tension in the conductors.

### 3,586,294
### METHOD AND APPARATUS FOR CREATING A SUSPENSION OF FINE PARTICLES IN A LIQUID

James J. Strong, 22 Diaz Avenue, San Francisco, Calif.

Filed Feb. 20, 1969, Ser. No. 801,086
Int. Cl. B01f *5/00*
U.S. Cl. 259—18 9 Claims



A novel arrangement of fluid nozzles or spargers is positioned in a critical manner above a bed of sludge in the bottom of a settling tank or phase separator, such as that employed in a powdered ion exchange process of water treatment. Operation of the spargers causes a complete 100 percent suspension of the fine particles comprising the sludge thereby making complete removal of the particles by pumping out the suspension possible without the use of any mechanical agitators. Especially adapted in connection with nuclear processes where radioactivity of the sludge creates a problem, not only of suspension but also the necessity for complete 100 percent removal.

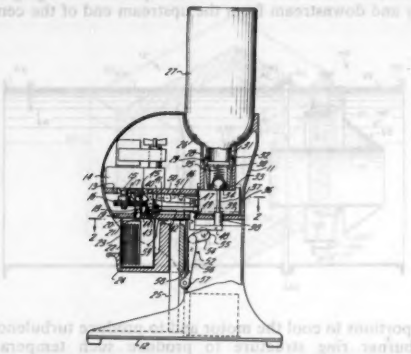
### 3,586,295
### ROTARY MIXER

Howard Price, Kings Point, and Bela Szilagyi, Flushing, both of, N.Y., assignors to International Patents & Development

Filed Aug. 16, 1968, Ser. No. 753,182
Int. Cl. B01f *15/02, 7/18*
U.S. Cl. 259—24 5 Claims

A motor-driven mixing apparatus for mixing creamy or pasty substances of various consistencies in measured

batches. A container in the apparatus, which is filled with a liquid from a bottle by the operation of a first valve in connection with the discharge movement of the mixed batch,



releases its contents into the mixing container by a second valve which is linked with the first valve when the mixing container is lifted into the operational position.

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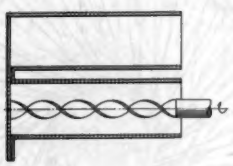
**3,586,296**

**APPARATUS FOR PRODUCING A FLOW OF LIQUID OF LINEARLY VARYING DENSITY**

**Svante Harry Rilbe, Vastra, Olaf A. Vesterberg, Solna, and Sune Pettersson, Goteborg, all of, Sweden, assignors to Ingenjorsfirma Consulta, Skondalsvagen, Sweden**

**Filed Mar. 28, 1969, Ser. No. 811,477**
**Claims priority, application Sweden, Feb. 28, 1968, 2,556/68**
**Int. Cl. B01f 7/16**
**U.S. Cl. 259—66** **7 Claims**



An improved constant density gradient mixer comprises two open vessels communicating at their bottoms, one of which vessels having a constant free cross-sectional area "A" and being equipped with stirring means and an exit tube. The other vessel has a variable free cross-sectional area $A/f(x)$ the function $f$ varying with the height $x$ essentially as demanded by the equation

$$f(x)=\sqrt{1+x/a}$$

where the distance $a$ is defined by the equation

$$a=V_1P_0/8A(\Delta P)_1,$$

in which $V_1$ is the total initial volume,

$P_0$ is the density in the vessel without stirrer, and

$P_1$ is the density in the vessel with stirrer.

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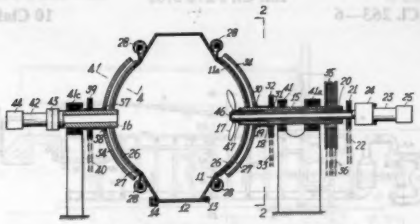
**3,586,297**

**METHOD AND APPARATUS FOR MIXING CHEMICALS**

**Taichi Hotta, Osaka, Japan, assignor to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan**

**Filed Nov. 13, 1969, Ser. No. 876,255**
**Int. Cl. B01f 9/00**
**U.S. Cl. 259—72** **2 Claims**

A method of mixing chemicals by a mixing machine comprising a container and a hollow shaft whose one end thrusting itself into the container, to which an oscillating device to oscillate the container in relation to said hollow shaft is connected. Gaseous body in said container is sucked up to attain the desired pressure, including vacuum, so as to equalize



falling and diffusing speeds of materials having different apparent specific gravity in said container, thereby effecting uniform and efficient mixing of materials.

A mixing apparatus as mentioned above.

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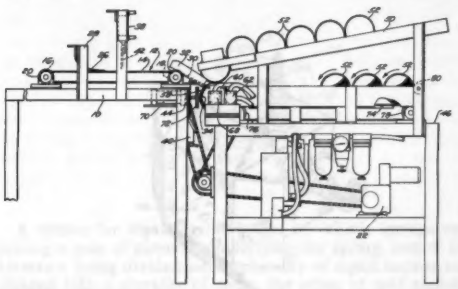
**3,586,298**

**APPARATUS FOR HANDLING AND DRYING PENCIL LEADS**

**Verlon E. Wiser, Shelbyville, and Charles W. McCallie, Bell Buckle, both of, Tenn., assignors to Hasbro Industries, Inc., Pawtucket, R.I.**

**Filed Nov. 24, 1969, Ser. No. 879,381**
**Int. Cl. F27b 9/16; F27d 3/12**
**U.S. Cl. 263—6 R** **8 Claims**



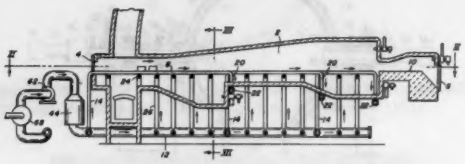
Apparatus for handling and drying pencil leads comprising means for receiving the leads after extrusion and cutting thereof but while the leads are still moisture laden and hence limp and easily deformable, said means maintaining the leads in straightened condition while loading the leads into cylindrical cans, the loaded cans being rotatable about their own axes to maintain the leads therein in straightened condition, the apparatus further comprising a rotary furnace for receiving the loaded cylindrical cans to effect drying of the leads, said rotary furnace comprising a rotor that slowly moves the loaded cans through an annular heating chamber, the loaded cans being mounted on discs which are rotatably mounted on the rotor, and drive means for simultaneously imparting rotation to the rotor and to the discs, the rotation of the latter being at a substantially greater rate than the rotation of the former, whereby as the rotor slowly carries the loaded cans through the heating chamber, the discs are simultaneously rotating about their own axes.

**3,586,299**

## METHOD AND APPARATUS FOR HEATING A WORKPIECE

**Justin E. Foldessy, Pittsburgh, Pa., assignor to United States Steel Corporation**

**Filed Nov. 20, 1969, Ser. No. 878,385**
**Int. Cl. F27d** *3/02*
**U.S. Cl. 263—6** **10 Claims**



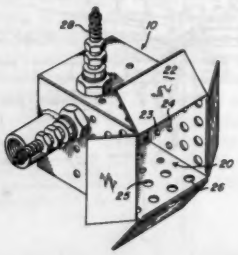
In a furnace in which a workpiece is supported on hollow supporting members, a fluid heat transfer medium is circulated through a closed system which includes the hollow supporting members. The heat transfer medium which has a boiling point of at least 300° F. is introduced into the supporting member at a temperature of at least 300° F. and cooled when leaving the supporting members to a minimum temperature of 300° F. A pump is provided for circulating the heat transfer medium and a heat exchanger is provided between the exit side of the supporting members and the entry side of the pump. The medium in the closed system is preferably maintained at super-atmospheric pressures.

**3,586,300**

## BURNER UNIT

**Homer K. Monroe, Piqua, Ohio, assignor to Aerovent Fan Company, Inc., Piqua, Ohio**

**Filed July 15, 1969, Ser. No. 841,837**
**Int. Cl. F23l** *9/04*
**U.S. Cl. 263—19** **16 Claims**



A gas burner particularly adapted to heat a passing airstream, distinguished by a chamber having at least one discharge opening in the direction of airflow and including means peripherally projected to intercept and trap a portion of the airstream and pressure it laterally through openings to said chamber in a manner to uniquely influence and support therein the ignition and complete combustion of gas. The invention units produce an optimal concentration of directed heat for raising the temperature of a passing airstream.

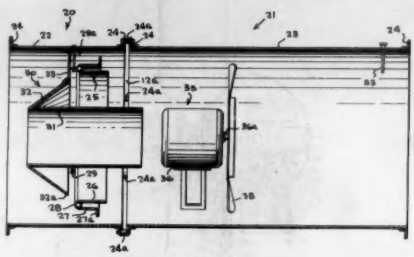
**3,586,301**

## AGRICULTURAL PRODUCTS DRYING HEATER

**James L. Shipp, Bogalusa, La., and Joe E. Salmon, Prattville, Ala., assignors to Continental/Moss-Gordin, Inc., Prattville, Ala.**

**Filed Sept. 29, 1969, Ser. No. 861,624**
**Int. Cl. F23l** *9/04*
**U.S. Cl. 263—19 A** **8 Claims**

An agricultural products drying heater unit including an airfoil member, a burner ring structure, and a motor-driven fan arranged serially between the inlet and outlet ends of a cylindrical tubular elongated shell. The airfoil member has an axially elongated cylindrical center tube portion coaxial with the shell and a truncated conical skirt portion diverging outwardly and downstream from the upstream end of the center tube portions to cool the motor and to produce turbulence at the burner ring structure to produce such temperature uniformity across the shell outlet area that the heated air temperatures at either outlet side of a tandem valve will be substantially the same.

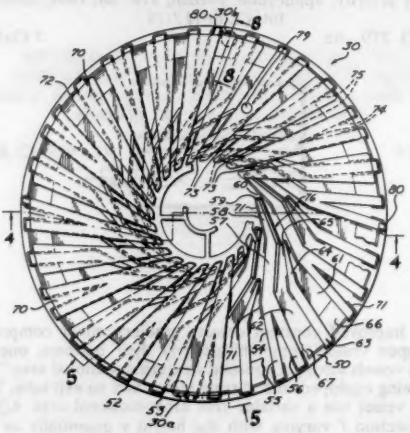


**3,586,302**

## LOAD SUPPORT DIFFUSER

**Robert Lee Corbett, Jr., 22732 Westlake Road, Rocky River, Ohio**

**Filed May 23, 1968, Ser. No. 731,544**
**Int. Cl. F27d** *5/00*
**U.S. Cl. 263—47** **16 Claims**



There is disclosed herein a unitized assembly adapted to support vertically stacked coils in an annealing furnace and diffuse a protective atmosphere gas within said furnace, the assembly comprising a flat base, means defining a central opening for receiving a blower or recirculating fan, structural members defining generally outwardly directed flow controlling passages, deflectors for diffusing the gas upwardly at the periphery of the support, and integral support bars carried by said structural members.

**3,586,303**

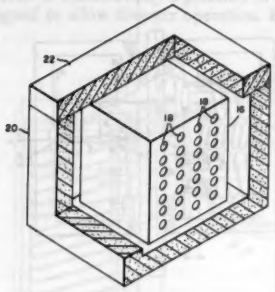
## CARBON MOLD FOR MANUFACTURE OF TANTALUM CARBIDE FILAMENTS

**Stanley Lee, Garfield, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed May 19, 1969, Ser. No. 825,638**
**Int. Cl. C21d** *1/06*
**U.S. Cl. 266—5** **4 Claims**

A mold form for use in the carbiding of filament coils which substantially comprise tantalum and which mold form

comprises a carbon block having a plurality of cylindrical bores therethrough. Each of the cylindrical bores are of a



diameter only slightly larger than the external diameter of the filament coil which it is adapted to receive.

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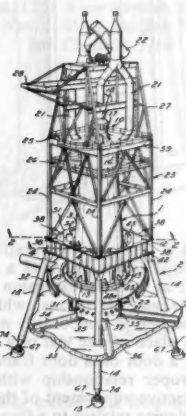
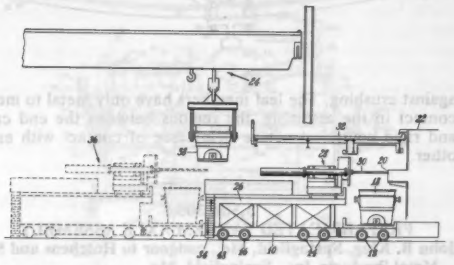
**3,586,304**
**FURNACE COOLING SYSTEM**
**Melvin J. Greaves, Cleveland, and Tage Werner, Rocky River, both of, Ohio, assignors to Arthur G. McKee & Company, Cleveland, Ohio**
**Division of Ser. No. 778,883, Aug. 29, 1968, which is a division of Ser. No. 520,945, Jan. 16, 1966, Pat. No. 3,431,691. Filed Dec. 8, 1969, Ser. No. 883,220**
**Int. Cl. C21b** *7/00;* **E04c** *3/30*
**U.S. Cl. 266—32** **6 Claims**



A shaft furnace, such as a blast furnace, has hollow cooling staves extending transversely around the circumference of the furnace in the shaft wall lining. The upper portions of the staves are substantially wider than the lower portions, and preferably extend inwardly into the furnace lining, to provide support for the furnace lining above the staves. Preferably the staves are arranged so that certain of them are located above other staves, the upper portions of the lower staves being substantially wider than the lower portions of the staves above them, to aid in supporting the lining. Where the furnace has a mantle at the lower end of the shaft portion extending inwardly of the furnace shell and forming a reentrant corner, the staves are preferably disposed in the lining in the reentrant corner in the vicinity of the mantle, with the wider upper portions of the staves projecting into the lining to support the lining, and to distribute the load of the lining downwardly into the reentrant corner.

**3,586,305**
**FURNACE TAPPING SYSTEM**
**Arthur E. Smith, Niagara Falls, Ontario, Canada, assignor to Union Carbide Corporation, New York, N.Y.**
**Filed Dec. 19, 1968, Ser. No. 785,140**
**Int. Cl. C21b** *7/12*
**U.S. Cl. 266—42** **8 Claims**



A movable platform system for tapping a smelting furnace is provided. The platform carries empty ladles to the furnace and after they are filled, the platform is withdrawn and the ladles are removed and replaced. The platform is constructed so as to encircle at least one-fourth of the furnace periphery so that a plurality of ladles can be placed around the furnace at the same time.

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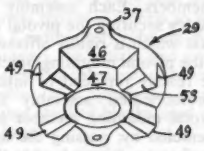
**3,586,306**
**RAILWAY VEHICLE SUSPENSION HEIGHT ADJUSTMENT DEVICE**
**James J. Reece, Caseyville, Ill., and Richard L. Lich, Town and Country, Mo., assignors to General Steel Industries, Inc., St. Louis, Mo.**
**Filed Mar. 6, 1969, Ser. No. 804,751**
**Int. Cl. B61f** *5/08;* **F16f** *1/04;* **F16m** *11/04*
**U.S. Cl. 267—3** **17 Claims**



A device for adjusting the height of vehicle springs comprising a pair of elements underlying the spring, one of said elements being divided into a plurality of equal sectors each divided into a plurality of steps, the other of said elements having equiangularly spaced surfaces selectively engageable with corresponding steps of each sector, whereby upon relative rotation of said elements with respect to each other the combined height of said elements may be varied, said device also including means for lifting the spring load from said elements to permit their relative rotation.

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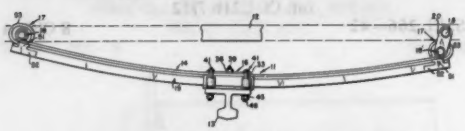
**3,586,307**
**COMPOSITE SPRING ASSEMBLY**
**Nelson R. Brownyer, Bloomfield Township, Mich., assignor to North American Rockwell Corporation, Pittsburgh, Pa.**
**Filed June 25, 1969, Ser. No. 836,430**
**Int. Cl. F16f** *1/22*
**U.S. Cl. 267—47** **12 Claims**

A composite leaf spring assembly adapted to be interposed between a vehicle body and a supporting axle unit comprises two substantially coextensive individual leaf members, one being a constant width, constant thickness steel element and the other being made mainly of hard tough plastic. The opposite ends of the plastic leaf member carry metal caps also formed to extend around eyes on the ends of the steel member for attachment to the vehicle body. A central rigid

boxlike structure fixedly secures intermediate portions of both of said leaf members together and to said axle unit, and this structure encloses and protects the plastic leaf member



against crushing. The leaf members have only metal to metal contact in the assembly, the regions between the end caps and rigid central structure being free of contact with each other.

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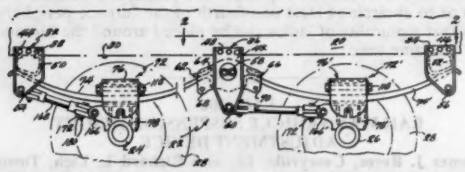
**3,586,308**
**PREFABRICATED TANDEM AXLE ASSEMBLY**
**John B. King, Springfield, Mo., assignor to Hutchens and Son Metal Products, Inc., Springfield, Mo.**
**Filed Jan. 24, 1969, Ser. No. 793,713**
**Int. Cl. B60g** *11/02*
**U.S. Cl. 267—52** **11 Claims**



A prefabricated spring assembly for tandem axles and the like is provided comprising axle brackets and pivotal mounting members having leaf springs passing therethrough with wedging elements locking the leaf springs in position within the mounting members. Each assembly is provided with means for detachably securing the pivotal mounting member to the axle bracket which is rigidly affixed to an axle of the vehicle whereby the pivotal mounting bracket and leaf spring assembly can be readily replaced or interchanged by substituting one prefabricated assembly for another. The prefabricated pivotal mounting member and leaf spring assemblies are assembled by: passing the leaf spring through the mounting member; applying a load to the spring in excess of any load requirements designated for the vehicle on which the assembly is to be used; drawing the wedging elements together to wedge the spring in place while the spring is under the load; securing the wedging elements in place while the spring is under the load and then releasing the load thereby forming the prefabricated spring assembly wherein the spring is affixed within the mounting member for any load up to the preloading value.

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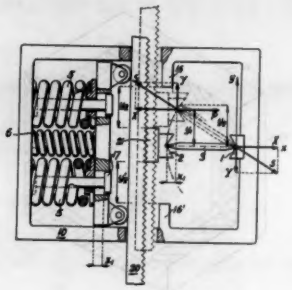
**3,586,309**
**UNSTABLE DAMPENER**
**Ladislav Freibauer, Prague, Czechoslovakia, assignor to Vyzkummy ustav kolejovych vozidel, Praha, Czechoslovakia**
**Filed Jan. 3, 1969, Ser. No. 788,706**
**Claims priority, application Czechoslovakia, Feb. 8, 1968, 955-68**
**Int. Cl. F16f** *3/00, 13/00, 15/02*
**U.S. Cl. 267—136** **5 Claims**

A suspension device having a labile characteristic and suited for connection in parallel with a spring group having a stable characteristic so as to achieve a soft characteristic. At least one planar mechanism includes two supporting members and an interposed strut. A pair of mutual sprung parts respectively carry these supporting members and guide them in the direction of the springing motion. The axis of the strut in the neutral position of the mechanism extends perpendicular to the direction of springing motion, and its position during spring action is inclined in one or the other direction from the neutral position. A group of springs urges the supporting members toward the strut. This group of springs



develops precompression in a direction perpendicular to the springing direction.

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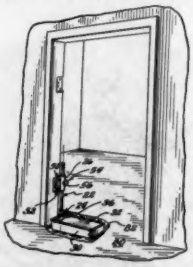
**3,586,310**
**INSTALLATION FIXTURE FOR DOOR CONTROL DEVICES**
**William A. Czapar, Niles, Ill., assignor to Rixson Inc., Franklin Park, Ill.**
**Filed Sept. 27, 1968, Ser. No. 763,329**
**Int. Cl. B25b** *11/02*
**U.S. Cl. 269—1** **3 Claims**



An elongated rod is removably secured to the spindle or shaft of a door control device (such as a spindle-type door closer, for example) as an axial extension of the spindle or shaft. A supportable guiding means, which comprises an elongated sleeve member, is temporarily mounted to a door frame, preferably in place of one leaf of a hinge or pivot for pivotally supporting a door on a door frame, for guiding the rod vertically in proper relationship with the pivotal axis while permitting selective adjustment of the vertical position of the door control device relative to a floor or, in the case of an overhead door closer, relative to the upper door frame in which it is to be installed. Locking means is provided for releasably locking the rod to the guiding means at the selected vertical position. Accordingly, the door control device may be positioned at a selected vertical position and with its spindle in proper aligned relationship with the pivotal axis of the hinges or other pivotal supports for the door.

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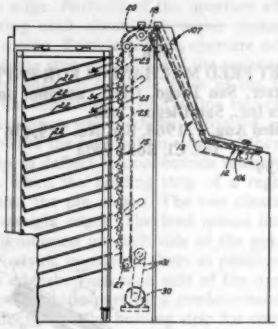
**3,586,311**
**SELECTING APPARATUS**
**Erwin F. C. Schulze, Novelty, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio**
**Filed May 23, 1969, Ser. No. 827,394**
**Int. Cl. B65h** *39/02*
**U.S. Cl. 270—58** **16 Claims**

An apparatus to choose one or more of a plurality of destination bins and to divert one or more sheets into the selected bins. One of a plurality of devices is to be selected for operation to divert sheets into the selected bin.

The sheets are carried by a conveyor, and a diverter at each bin extends into the path of the sheets to divert the sheets into the bin. A diverter is usually mechanical in nature, and is part of a mechanism known to the art as a gate.

Each diverter is controlled by a plurality of tumblers which must be aligned to allow diverter operation. Each tumbler is



movable into one of two positions by a drive device. A notch on the tumbler surface is either in operation position, or not. All must be in operation position to cause the diverter to be active.

The drive device for each diverter is operated from a remote control station to select the proper diverter at the proper time.

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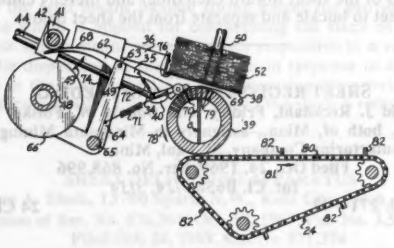
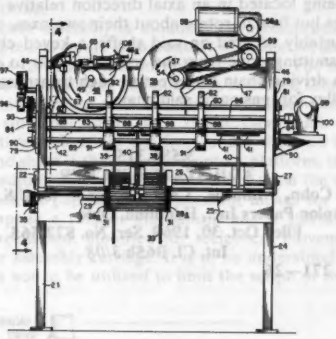
**3,586,312**
**ENVELOPE FOLDER**
**David G. Sammons, 1211 Avon Avenue, S.W., Atlanta, Ga.**
**Filed Nov. 1, 1968, Ser. No. 772,769**
**Int. Cl. B65h** *3/10*
**U.S. Cl. 271—2** **5 Claims**



An envelope folder including a feed mechanism, a scoring mechanism, a folding mechanism, and a delivery mechanism. The feed mechanism includes a separator arm for separating a single envelope blank from the bottom of a stack of blanks, and for urging the envelope blank against a rotary vacuum drum. The separator arm includes rollers for rolling over the surface of the vacuum drum and the envelope blank transferred to the vacuum drum. The scoring mechanism includes scoring blades which are adjustable toward and away from each other, and which are supported at various points along their lengths. The folding mechanism comprises a pair of rollers which urge each successive envelope blank to a predetermined position, releases the envelope blank, and grasps the envelope blank again and moves it in a different direction to effect a fold on the score line on the envelope. The delivery mechanism includes a disc defining curved slots for receiving envelopes and carrying the envelopes to a stacking station, and an endless belt extending around the axle of the disc and movable toward the stacking station to gradually urge the envelopes out of their respective slots as they approach the stacking station.

**3,586,313**
**ARTICLE SEPARATOR**
**Thomas W. Ebeling, 10393 Radabaugh Drive, Montgomery, Ohio**
**Filed May 31, 1968, Ser. No. 733,645**
**Int. Cl. B65h** *5/22*
**U.S. Cl. 271—3** **13 Claims**



An apparatus and method for separating stacked, flat articles. Apparatus includes a conveyor assembly for feeding a plurality of stacked, flat articles to a separator assembly for separating the front article from the remainder of the stacked articles. The separator assembly includes a pivoted vacuum arm engaging a corner of the front article and swings it outwardly to initially enable the first separator disc to cut in behind the outermost article. A pair of rotating discs, having segments cut therefrom, enter between the front article and the one immediately behind to bend the top of the article outwardly for withdrawal from the stack. A forwarding assembly engages the outwardly bent top of the first article and withdraws it from the stack. The forwarding assembly includes a set of delivery segment wheels which are periodically actuated to press the forwardly bent top edge of the article against oppositely mounted wheels to withdraw the article from the stack. Continuously rotating matching forwarding wheels then engages the article and conveys it on to a conveyor belt or other suitable device for carrying away the articles in single file. The apparatus is particularly well adapted for separating stacked blanks used in manufacturing gusseted multiwall bags.

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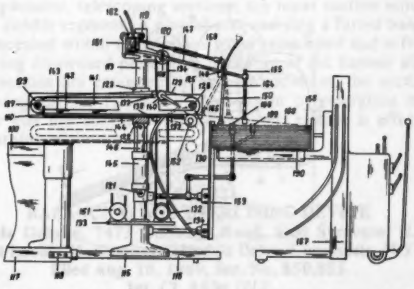
**3,586,314**
**SHEET FEEDING DEVICE**
**Luigi Samoggia, 32 Via Gandino, Bologna, Italy**
**Filed Nov. 29, 1968, Ser. No. 779,752**
**Claims priority, application Italy, Jan. 18, 1968, 1507A/68**
**Int. Cl. B65h** *5/02, 1/18*
**U.S. Cl. 271—12** **19 Claims**



An automatic sheet feeding device, particularly for feeding machines for processing thin metal plates, wherein the sheet

feeder is formed by two columns supported by feet displaceable on longitudinal guides fixed to the machine base in which the two columns are connected together by means of cross pieces along which a horizontal beam is displaced whilst guided by sleeves connected to the beam itself comprising a pair of shafts, a reducing gear, two side members being connected to the beam, the first side member fixed and the second side member variable according to the width of the sheets to be fed, and located at the ends of said shafts, said shafts being located in an axial direction relative to the side members but free to rotate about their own axes, two pulleys are adjustably secured on said shafts, a keyed chain pinion for transmitting drive from the reduction gear to one of said shafts, a driving chain for effecting such transmission and an idler pulley for tensioning said chain.

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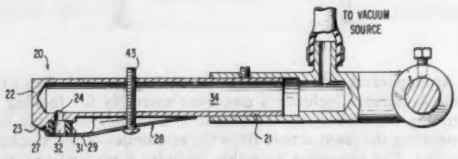
**3,586,315**

**ADJUSTABLE SUCKER**

**Robert Cohn, Millbrae, Calif., assignor to U.S. Plywood-Champion Papers Inc., Hamilton, Ohio**

**Filed Oct. 30, 1969, Ser. No. 872,565**
**Int. Cl. B65h** *3/08*
**U.S. Cl. 271—26** **9 Claims**




An improved sucker for handling thin flexible sheets of material such as paper has a shank and head in L-shaped configuration, a vacuum port in the head connected to an air or vacuum passage in the shank, a spring with a flat suction face overlying the port, a gasket around the port and between the spring and the head, air passage means through the spring and gasket connected to the port, and an adjusting means such as a screw to move or flex the spring member whereby to change the angle presented by the spring suction face to the flexible sheet of material that is to be engaged and moved thereby.

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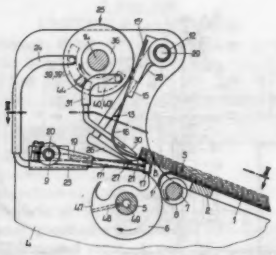
**3,586,316**

**APPARATUS FOR FEEDING SHEETS, BLANKS AND THE LIKE**

**Gunter Ehlscheid, Niederbieber, and Ernst Meess, Neuwied, both of, Germany, assignors to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei K.G., Neuwied am Rhine, Germany**

**Filed Oct. 6, 1969, Ser. No. 864,014**
**Claims priority, application Germany, Nov. 16, 1968, P18 09 376.8**
**Int. Cl. B65h** *3/08*
**U.S. Cl. 271—29** **4 Claims**



An apparatus used for feeding sheets, blanks and the like from beneath a pile into a converting or processing machine, particularly a machine for making envelopes and the like, includes a middle rocking sucker engaging the bottom sheet of a pile and side suckers which rock along with the middle sucker. The apparatus is particularly characterized in that a separate control member is provided for the side suckers. This control member controls the start of the suction of the side suckers with a time delay with respect to the start of suction of the middle sucker and causes the suction of the side suckers to end simultaneously with the end of suction of the middle sucker.

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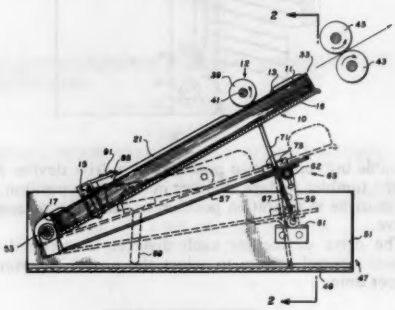
**3,586,317**

**SHEET FEED MECHANISM FOR PAPER**

**Louis A. Smitzer, San Diego, Calif., assignor to Stromberg Datagraphics Inc., San Diego, Calif.**

**Filed Aug. 1, 1968, Ser. No. 749,436**
**Int. Cl. B65h** *1/08*
**U.S. Cl. 271—39** **2 Claims**



Apparatus is described for individually feeding flexible sheets from a stack thereof. Roller means drive the top sheet of the stack off the remainder of the stack while a pair of hinged and weighted pressure members, in frictional engagement with the top sheet, produce displacement of the trailing corners of the sheet toward each other and thereby cause the top sheet to buckle and separate from the sheet below.

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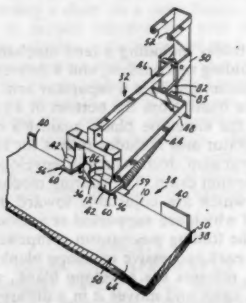
**3,586,318**

**SHEET REGISTRATION AND FEEDING**

**Segwald J. Reckdahl, Fridley, and Donald W. Folske, Oakdale, both of, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Oct. 24, 1969, Ser. No. 868,996**
**Int. Cl. B65h** *3/24, 3/34*
**U.S. Cl. 271—42** **24 Claims**



A set of sheets in registered in a stack on a pin means and adjacent guide means. The sheets are fed seriatim from the stack by feed means operating with a predetermined force. The pin means have a semicircular cross-sectional configura-

tion. Each sheet in the set contains a registration edge for registering each sheet with the guide means and an aperture for registering each sheet with the pin means. The aperture is positioned in a prescribed relationship to and closely adjacent the registration edge. The aperture edge and the registration edge define a holding strip of varying width. The narrowest portion of the holding strip defines a separation region of a predetermined width between the aperture and the registration edge. Portions of the aperture edge are shaped for registering each sheet with a pin means adjacent the separation region. Portions of the aperture edge in common with the holding strip and adjacent the registering portions of the aperture edge on opposite sides of the registering portions from the separation region define two clearance edges. The two clearance edges converge toward each other in a direction toward the registration edge and thereby enable the holding strip to deflect to concentrate tension in the separation region when the holding strip of a registered sheet is forced against the pin means. The two clearance edges are preferably straight edges. The feed means include feed legs which are positioned on each side of the pin means for engaging the outside registered sheet at positions adjacent the registration edge beyond each side of the aperture; and the feed legs are spaced apart by a predetermined distance for causing deflection of the holding strip for concentrating tension in the separation region when the holding strip is forced against the pin means by the feed legs feeding the registered and engaged sheet from the stack. The feed legs are also spaced apart by a predetermined distance for enabling the feeding of the engaged sheet from the stack; that is, the feed legs must be placed close enough together to cause sufficient force to be applied between the holding strip and the pin means to enable the separation of the holding strip upon the operation of the feed means. The feed means include means for engaging the feed legs with the registration edge of an outside registered sheet for enabling the feed legs to push against the engaged registration edge to feed the engaged sheet from a registered stack. The feed means also include means for applying a force to compress the stack for aligning the registration edge of the outside registered sheet with the feed legs to enable the engagement of the feed legs with the registration edge. The feed legs are variably disposed to the holding means in response to variations in the size of a stack; and the feed means include spring means for providing the force which is applied for compressing the stack of sheets. These spring means are operatively responsive to a variation in the disposition of the feed means in response to a reduction in the size of the stack for decreasing the provided applied compressive force as the size of the stack is reduced.

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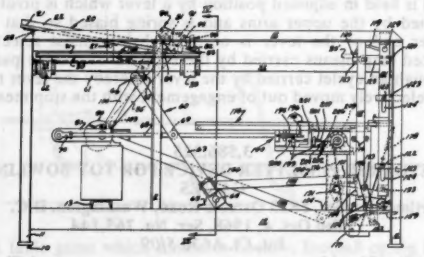
**3,586,319**

## SHEET DELIVERING APPARATUS

**James A. Black, 13700 Sparta N.W., Kent City, Mich.**

**Division of Ser. No. 676,264, Oct. 18, 1967, Pat. No. 3,501,986. Filed Oct. 28, 1969, Ser. No. 871,374**
**Int. Cl. B65h *29/34***
**U.S. Cl. 271—88** **2 Claims**



A slitting and scoring apparatus having a feedboard from which the sheets of stock are adapted to be drawn by means of a reciprocating table which slides from a first position generally beneath the feedboard to a second position generally to the side of it. The table grips the sheets by means of vacuum apertures thereon and draws them beneath the series of laterally aligned scoring or slitting knives. A pair of vacuum ports are provided adjacent a shoulder on the feedboard for sensing proper stock alignment by means of a vacuumstat. The sensing of proper alignment enables operation of the knives and, additionally, the sucker assembly which removes the sheets from the table at the end of its delivery stroke.

The sucker assembly is mounted on a reciprocating carriage adapted to come into contact with the surface of the table at the termination of its delivery stroke. The sucker assembly has a plurality of vacuum cups activated selectively as it comes into contact with the table and these vacuum cups grip the slit stock strips and retain them such that the reciprocating table slides out from under them on its return stroke. The sheet is then dropped onto a platform, the height of which adjusts automatically depending upon the thickness of the stack of papers. The adjustment means for the platform comprise a ratchet mechanism and a stack-thickness sensing mechanism mounted for reciprocal movement with the sucker assembly carriage. It is to be understood that this abstract is not to be utilized to limit the scope of this invention.

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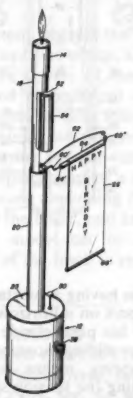
**3,586,320**

## POP-UP CANDLE AMUSEMENT DEVICE

**John A. Mace, 24 Hunting Ridge Road, Stamford, Conn.**

**Filed Oct. 7, 1968, Ser. No. 765,596**
**Int. Cl. A63h *5/00, 13/16***
**U.S. Cl. 272—27** **4 Claims**




The disclosed amusement device includes inner and outer spring-loaded, telescoping sections; the inner section mounting a candle segment. A pivotal arm carrying a furled banner is concealed within the sections when telescoped and is freed to swing downward permitting unfurling of the banner when the sections are extended. In one embodiment, the sections are progressively released for extension by operation of a music box mechanism, while in another, release is effected by burning of the candle.

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**3,586,321**

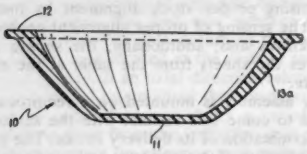
## BALANCING AND EXERCISING DEVICE

**Pamela Gehrke, 7473 Collamer Road, East Syracuse, N.Y., and Lucille M. Camuso, Hillsdale Drive, Constantia, N.Y.**

**Filed Aug. 18, 1969, Ser. No. 850,855**
**Int. Cl. A63g *1/12***
**U.S. Cl. 272—33** **2 Claims**

A unitary bowl, oval in plan has an oval flattened bottom and an outwardly projecting flat rim on which a user can

stand to rock and spin the bowl. Alternatively, a child can sit in the bowl or one can can stand in it with one foot and spin.



The sidewalls are thickened at the ends of the bowl so that an eccentric motion is obtained when the bowl is rocked and spun around along the perimeter of the oval bottom.

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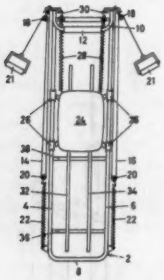
**3,586,322**
**COMBINED ROWING APPARATUS AND EXERCISING APPARATUS**
**Odd Kverneland, Haugesund, Norway, assignor to Johannes Ostensjo & Co. A/S, Haugesund, Norway**
**Filed June 21, 1968, Ser. No. 738,945**
**Claims priority, application Norway, July 1, 1967, 168,912**
**Int. Cl. A63b** *69/06, 21/04, 21/16*
**U.S. Cl. 272—72** **1 Claim**



Rowing apparatus having a substantially rectangular frame for alternative support on a horizontal surface and a vertical surface. The frame has parallel side members and a seat carriage with means for sliding movement on the side members. A first tension spring means is provided with means removably connecting the tension spring means between the seat carriage and the front of the frame. Two handles are at opposite sides of the frame and a separate line is attached to each handle. A pair of first pulleys are connected to the front of the frame and a pair of rear pulleys connected by a second tension spring means to the rear of the frame. The lines pass respectively from each said handle, round the first pulley, round the rear pulley and then forwardly whereby each rear pulley is acted on by at least two runs of line so that after removal of the seat carriage the apparatus may be mounted vertically for arm exercising. A crossbar is mounted on the front of the frame serving as a footrest in the horizontal position of the frame and as a handgrip in the vertical position of the frame.

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**3,586,323**
**AQUATIC GAME**
**John A. Carter, 594 Pearl Street, Reading, Mass.**
**Filed July 12, 1968, Ser. No. 744,580**
**Int. Cl. A63f** *9/00*
**U.S. Cl. 273—1** **7 Claims**

An aquatic game wherein buoyant balls are placed in a floating receptacle through an inlet located below the water surface. The receptacle comprises a basketlike container with a tubular member having one end extending through its bottom surface and the other end, into which the balls are placed, located well below the water surface. The object of

the game is either to place the most balls in the receptacle within a given time or place a given number of balls in the receptacle in the shortest time.

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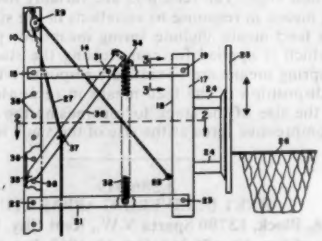
**3,586,324**
**VERTICALLY ADJUSTABLE BASKETBALL GOAL**
**Benhard M. Bearson, Lanesboro, Minn., assignor to Goals, Inc., Lanesboro, Minn.**
**Filed Apr. 14, 1969, Ser. No. 815,720**
**Int. Cl. A63b** *63/04*
**U.S. Cl. 273—1.5 R** **2 Claims**



A basketball goal is carried by upper and lower pairs of parallel arms which are pivoted to a support so that the goal may be vertically adjusted by means of a flexible cable passing over a pulley carried at the top of the support. The goal is held in adjusted position by a lever which is pivotally carried by the upper arms and is spring biased so that the lower end of the lever is normally held against selected, spaced stop means carried by the support. The cable passes through an eyelet carried by the lever whereby the lever may be selectively moved out of engagement with the stop means.

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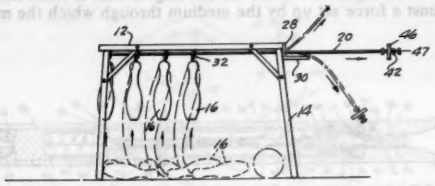
**3,586,325**
**TETHERED PINSETTER DEVICE FOR TOY BOWLING GAMES**
**Mortimer Lorber, 5823 Osceola Road, Washington, D.C.**
**Filed Oct. 4, 1968, Ser. No. 765,144**
**Int. Cl. A63d** *5/09*
**U.S. Cl. 273—44** **4 Claims**

A pinsetter for toy bowling games comprising a table frame support with a plurality of leg members extending therefrom and a plurality of bowling pins with flexible means attached to each individual pin and guide means for the flexible means

and means for moving the flexible means so as to raise the pin means from the surface on which they are disposed and



thereafter to lower the pin means onto the surface to position them in an upright manner.

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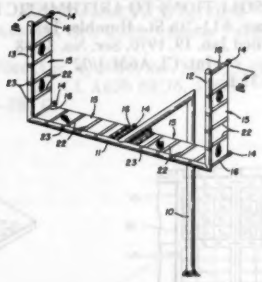
**3,586,326**
**FOOTBALL GOALPOST ATTACHMENT**
**Richard P. McKenna, 108 Terrace Ave., Marietta, Ohio**
**Filed May 20, 1969, Ser. No. 826,234**
**Int. Cl. A63b 67/00**
**U.S. Cl. 273—55** **8 Claims**



An attachment for football goalpost or the like in the form of panels which are attached to the uprights and sometimes to the crossbar of existing football goalpost to provide background or foreground areas, against which the football is more readily visible, to more readily determine whether the football passes inside or outside the goalpost uprights or over or beneath the crossbar.

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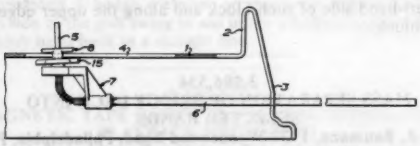
**3,586,327**
**GAME PIECE SUPPORT AND GUIDE**
**Stig Gunnar Hjelmquist, P.O. Box 6, S-573 00, Tranas, Sweden**
**Filed July 23, 1969, Ser. No. 843,983**
**Claims priority, application Sweden, Aug. 5, 1968, 10537/68**
**Int. Cl. A63f 7/06**
**U.S. Cl. 273—85** **5 Claims**



A table game which simulates hockey, football or the like and comprises a playing surface consisting of a board on which a puck, ball or the like is moved during the play by means of a number of player figures. These player figures are displaced by the participants of the game along slots provided in the board and rotated by means of control rods displaceably and rotatably mounted beneath the board. Each control rod is connected via an angular shaft joint to an upright which is mounted in a holder and is at right angles to the board. The upright extends through a corresponding slot in the board, on the upper side of which it constitutes an attachment for a player figure. Each holder has a crosspiece rotatably connected to the holder to permit the crosspiece to be passed through the slot in the board. The crosspiece is fixable to the holder in the position in which it extends in the transverse direction of the slot so that it can cooperate with the upper side of the board in order to support the holder.

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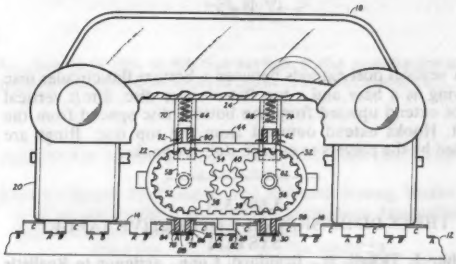
**3,586,328**
**MODEL CAR RACING SYSTEM**
**Sidney Kazel, 6131 N. Harding Ave., Chicago, Ill.**
**Filed Dec. 4, 1968, Ser. No. 781,076**
**Int. Cl. A63h 29/22; A63f 9/14**
**U.S. Cl. 273—86** **4 Claims**



A mode car racing system wherein the driver can steer the model car at such times as he so elects, said model car being constrained to follow the course of the track at all other times, and in a preferred embodiment comprising a track having a multiplicity of parallel slots following the course of the track, electrical terminals interspersed on the track and supplying speed and steering control voltages to the model cars regardless of the displacement of a model car along or across the track, key means depending from the model car and engaging the slots of the track, said key means displacing itself and the attached model car to adjacent slots and thereby across the width of the track in response to the steering control voltage.

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**3,586,329**
**ROLL AND CATCH TOY**
**Joseph F. Spreitzer, 1001 Cassie Drive, Joliet, Ill.**
**Filed Aug. 7, 1969, Ser. No. 848,268**
**Int. Cl. A63b 65/12**
**U.S. Cl. 273—96 R** **2 Claims**

An amusement device consisting of an arched track along which a ball is rolled from one end to the other and which

has an enlarged opening at said other end through which the ball falls. A receptacle can be provided at the end remote from the end having the opening to receive the ball.

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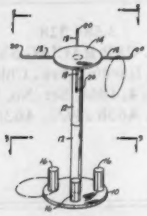
**3,586,330**
**PEG AND RING TARGET**
**Manuel A. Lema, 8925 Leland Ave., Sacramento, Calif.**
**Filed June 19, 1969, Ser. No. 834,625**
**Int. Cl. A63b** *65/10*
**U.S. Cl. 273—100** **4 Claims**



A vertical post extends between a bottom flat circular disc serving as a base and a top flat circular disc. Short vertical stubs extend upward from the bottom disc spaced from the post. Hooks extend outward from the top disc. Rings are tossed by the players to engage stubs or hooks.

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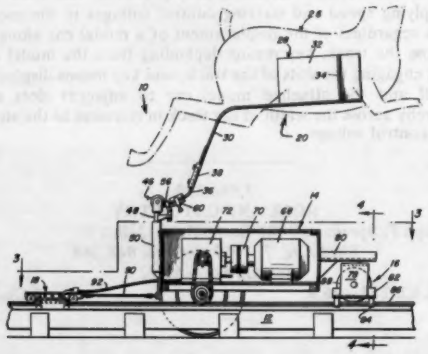
**3,586,331**
**THREE DIMENSIONALLY OPERATIVE TARGET SYSTEM**
**Arthur J. Tickell, Jr., Branford, Conn., assignor to Realistic Target Corporation**
**Substitute for application Ser. No. 453,051, May 4, 1965, now abandoned. This application Jan. 31, 1968, Ser. No. 707,353**
**Int. Cl. A63b** *63/00*
**U.S. Cl. 273—102.25** **6 Claims**



A three-dimensional target for marksmen is propelled along a prescribed path by an electrically powered vehicle, the motion of which is changed in response to sensing of vibration by a transducer. Vibrations are induced by impact of a bullet with rigid internal portions of the target having an outer shock absorbing portion offering little resistance to passage of bullets.

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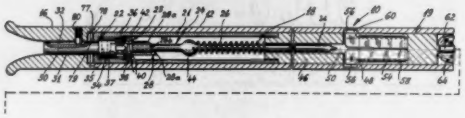
**3,586,332**
**TIME DELAY TRIGGERING UNIT**
**John M. Alban, 173 West 188th St., Bronx, N.Y.**
**Filed Mar. 15, 1968, Ser. No. 713,465**
**Int. Cl. F41b** *5/02*
**U.S. Cl. 273—106.5** **2 Claims**

A triggering unit is provided which will release at a preset time a device it is carrying such as a braking parachute. The triggering unit is housed in a missile capable of being fired through a gas or liquid medium and comprises a primary release mechanism which is connected to a slidable rod. The rod is arranged in the missile housing so that it must move against a force set up by the medium through which the missile passes or the friction forces between the rod and the housing. The rod, which is triggered by the primary release mechanism, will move a specified distance necessary to release the device carried by the unit. The time required for the shaft to move the specified distance is controlled by the forces against which the shaft must move.



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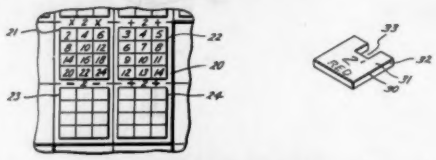
**3,586,333**
**ARITHMETIC GAME IN WHICH SLOTS IN PLAYING PIECES GIVE SOLUTIONS TO ARITHMETIC PROBLEMS**
**Thomas M. Abney, 611-7th St., Humble, Tex.**
**Filed Jan. 19, 1970, Ser. No. 3,868**
**Int. Cl. A63f** *3/02*
**U.S. Cl. 273—131 K** **2 Claims**



A mathematical game having a game board divided into four sections, each of which is coded. Each of the sections is divided into numbered areas with the numbers increasing progressively from the center of the board outwardly to the side of the board. Each of the areas is divided into one system of basic mathematics, division, subtraction, addition and multiplication, and each of such areas is progressively increasingly numbered from left to right, top to bottom, with numerals impressed thereon. A set of playing blocks is provided for each of the sections and is also coded to match the correspondingly coded section; a slot is cut in each of said blocks for positioning according to the number of such block with the position of such slot being determined by the number of the block with the numerical order being from left to right, top to bottom, such that, for example, a block for the numeral two would have a slot positioned inwardly from the left-hand side of such block and along the upper edge of such block.

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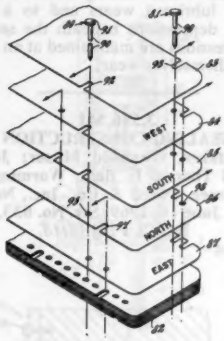
**3,586,334**
**MASS SEPARATION OF BRIDGE DECK INTO SELECTED HANDS**
**John A. Baumann, 1937 Wynnewood Road, Philadelphia, Pa.**
**Filed April 30, 1969, Ser. No. 820,381**
**Int. Cl. A63f** *1/14*
**U.S. Cl. 273—149 P** **4 Claims**

A standard size bridge deck of cards adapted to be partitioned on a mass basis into any one of a certain number of previously selected, special interest, bridge hands from a randomly arranged disordered deck. Partitioning is accom-

plished by means slots selector pins inserted into holes and slots in the card deck. The selector pins are located in the




deck by specially punched code cards which form a pilot pack.

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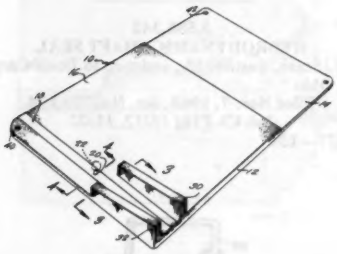
**3,586,335**
**GOLF PRACTICE DEVICE**
**Joseph J. D'Antonio, Sr., 2709 Athania Parkway, Metairie, La.**
**Filed Apr. 4, 1969, Ser. No. 813,497**
**Int. Cl. A63b** *69/36, 57/00*
**U.S. Cl. 273—186 C** **2 Claims**



A rectangular base having a plastic grass portion, a roughed flat portion for footing for a golfer, a plastic green tee on said plastic grass portion, and a pair of truncated hedge members mounted adjacent a line extending through the plastic tee and in line with a golfer's swing forming a straight swing plastic practice golfing green. Also there may be provided a hedge member arrangement disposed along each side of the golf swing to aid in the practice swing to take the club head back in a straight line.

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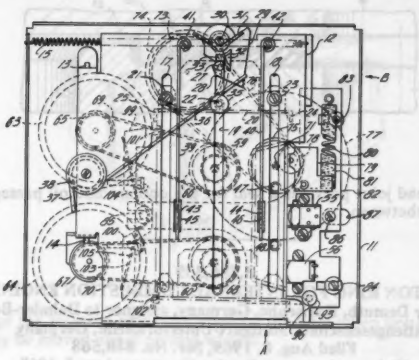
**3,586,336**
**MAGNETIC TAPE CASSETTE-TYPE RECORDING AND PLAYBACK MECHANISM**
**Leonard Rosenblatt, Beechhurst, N.Y., assignor to Scovill Manfacturing Company, Waterbury, Conn.**
**Filed Feb. 7, 1968, Ser. No. 703,725**
**Int. Cl. G11b** *5/00*
**U.S. Cl. 274—4** **12 Claims**

A magnetic tape sound recording and playback device for use with a cassette-type tape cartridge. Independent motor drives for winding and unwinding of the tape spools in the cassette and a further independent motor for driving the tape capstan. Two independent feelers which sense the presence



or absence of tabs in the rear surface of the cassette for controlling the erasing or recording electronics of the device.

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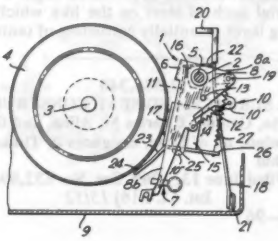
**3,586,337**
**MAGNETIC SOUNDHEAD MOUNTING FOR DICTATING MACHINES**
**Kurt Guttinger, Pfaffhausen, and Helmuth Strang, Wollerau, both of, Switzerland, assignors to Dictaphone International AG, Wittingen, Aargau, Switzerland**
**Filed Feb. 12, 1969, Ser. No. 863,723**
**Claims priority, application Switzerland, Feb. 12, 1968, 2025/68**
**Int. Cl. G11b** *21/12*
**U.S. Cl. 274—4 A** **9 Claims**



An arrangement for mounting a soundhead in a recording and reproducing device such as a dictating machine. The soundhead contacts a sheet or belt-type recording medium which is circularly arced about a cylinder for guiding the medium. The arrangement includes a pivotal mount for the soundhead and a support arm which is also pivotably mounted and contacts the recording medium. The support arm advantageously extends from the same pivot as used for the soundhead. This bearing arrangement provides for the easy, proper and simplified mounting of the soundhead.

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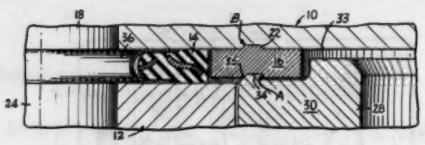
**3,586,338**
**COMBUSTION SEAL FOR ENGINES**
**Ernest P. Miklau, and John R. Crowe, both of Hagerstown, Md., assignors to Mack Trucks, Inc., Allentown, Pa.**
**Filed May 29, 1969, Ser. No. 829,030**
**Int. Cl. F16j** *15/04*
**U.S. Cl. 277—1** **14 Claims**

To provide a durable seal for combustion gases, a cylinder sleeve (or block) is formed with an annular bead preferably chamfered on its outer edge and a cylinder head is formed with an annular groove. A fire ring made of a deformable metal is placed on top of the bead so that when the cylinder head is clamped to the block, the fire ring is extruded by the

bead on the cylinder sleeve (or block) into the groove on the cylinder head. A separate gasket body provided in the block



to head joint provides a seal for the coolant and oil passages therebetween.

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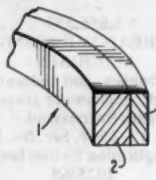
**3,586,339**

**PISTON RING FOR INTERNAL COMBUSTION ENGINES**

**Peter Demuth, Karlsruhe, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany**

**Filed Aug. 8, 1969, Ser. No. 848,568**
**Claims priority, application Germany, Aug. 8, 1968, P 17 51 853.5**
**Int. Cl. F16j** *15/16*
**U.S. Cl. 277—235R** **5 Claims**



A piston ring for internal combustion engines consisting of a base material such as steel or the like which is provided with a bearing layer essentially consisting of tantalum.

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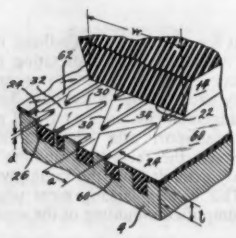
**3,586,340**

**WEAR SURFACE AND SEAL CONSTRUCTION**

**Dennis L. Otto, Canton; Charles M. Allen, and Craig T. Walters, Columbus, all of Ohio, assignors to Timken Company, Canton, Ohio**

**Filed June 13, 1969, Ser. No. 832,894**
**Int. Cl. F16j** *15/32*
**U.S. Cl. 277—96** **23 Claims**



A seal construction for forming a lubricant barrier between relatively movable members including a wear or working surface on one of the members and a flexible seal element on the other member. The working surface is composed of a multiplicity of triangular asperities arranged in a simple geometric array, and these asperities are engaged by a seal face on the seal element. The depressions between the asperities permit lubricant to contact the seal face and prolong the life of the seal. Most of the triangular asperities point toward the lubricant side of the seal construction so that the sidewalls of the asperities serve as pump impellers for pumping the lubricant back toward the lubricant source. Some of the triangular asperities may be oriented in the opposite direction to maintain adequate lubricant flow underneath the seal face. The depressions may be filled with a soft filler material which during relative rotation in the presence of the lubricant wears and to a limited extent reestablishes the depressions beneath the seal face. In this manner, the depressions are maintained at an optimum depth as the asperities themselves wear.

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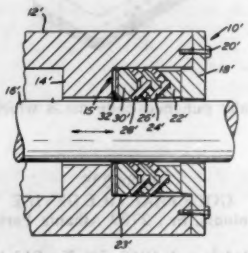
**3,586,341**

**SEALING CONSTRUCTION**

**Robert L. Whittaker, Gwynedd Manor; Joseph Donofry, Brommall, and Thorval L. Berg, Warminster, all of Pa., assignors to Green Tweed & Co., Inc., North Wales, Pa.**

**Filed June 16, 1969, Ser. No. 833,265**
**Int. Cl. F16j** *15/18*
**U.S. Cl. 277—124** **9 Claims**



A sealing construction is disclosed which comprises a stack of sealing rings. Each of the sealing rings has radially inwardly and outwardly directed legs. Each of the legs has a configuration so as to provide for line contact at a sealing edge.

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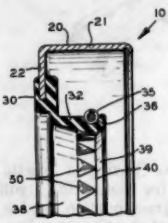
**3,586,342**

**HYDRODYNAMIC SHAFT SEAL**

**Thomas E. Staab, Justice, Ill., assignor to Dana Corporation, Toledo, Ohio**

**Filed Nov. 7, 1968, Ser. No. 774,154**
**Int. Cl. F16j** *15/32, 15/02*
**U.S. Cl. 277—134** **9 Claims**



Disclosed herein is a bidirectional hydrodynamic rotary shaft seal. The seal is of the radial lip type and has a plurality of hydrodynamic sealing elements adjacent the sealing lip. The sealing elements comprise triangular pads having a cylindrical concavity.

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**3,586,343**

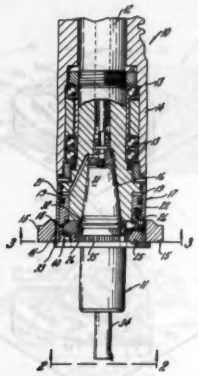
**TOOL-ORIENTING ARRANGEMENT**

**Robert E. Reed, Kaukauna, Wis., assignor to Giddings & Lewis, Inc.**

**Filed Apr. 21, 1969, Ser. No. 817,836**
**Int. Cl. B23b** *31/10*
**U.S. Cl. 279—1 A** **4 Claims**

A shank and socket type of interfitting tool adapter and

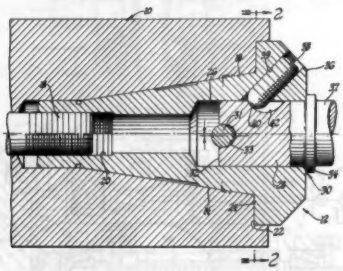
machine tool spindle having pins on the adapter and holes in the spindle to insure a particular angular orientation of the adapter relative to the spindle prior to interfitting of the parts and engagement of a multiple tooth type of driving clutch.



### 3,586,344
### QUICK-CHANGE TOOL ASSEMBLY

Raymond F. Nixon, Bloomfield Hills, Mich., assignor to Omark-Winslow Aerospace Tool Co., Arcadia, Calif.

Filed June 11, 1968, Ser. No. 736,040
Int. Cl. B23b 31/10
U.S. Cl. 279—83 6 Claims



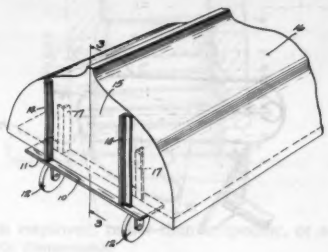
In a preferred form, the subject invention relates to assemblies adapted to enable repetitive positioning of cutting tools, and in a specific form comprises a driver or holder adapted to be carried by a machine tool spindle and having a bore therein arranged to receive a tool adapter so that a cutting surface carried thereon can be positioned in only one radial position relative to the spindle. The driver or holder includes a pin extending transversely of the bore which is slightly offset from the longitudinal axis of the bore. The pin is adapted to mate with a complementary shaped depression extending transversely of the adapter on the rear portion thereof and which is also offset from the longitudinal axis thereof a similar amount to that of the pin so that the two can be mated only when the adapter and cutting surface carried thereby is situated in one radial position.

### 3,586,345
### BOAT DOLLY

Jack I. Nall, 6040 W. Fairview Ave., Milwaukee, Wis.

Filed Jan. 3, 1969, Ser. No. 788,744
Int. Cl. B62b 1/00
U.S. Cl. 280—47.13 1 Claim

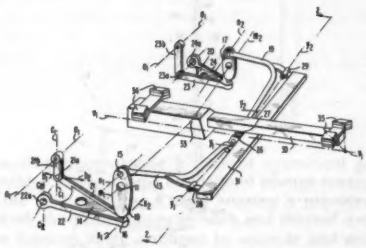
A rectangular plate base element, a pair of ground-bearing wheels disposed one adjacent each end projecting from one face of said plate, and angle iron means extending at right angles from the opposite face of the plate adapted to firmly engage the transom of a boat whereby the boat when upturned may be moved about on said wheels.



### 3,586,346
### AXLE SUSPENSION, ESPECIALLY REAR AXLE SUSPENSION FOR MOTOR VEHICLES

Wolfgang Sautter, Heimerdingen, Wurttemberg, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-unterturkheim, Germany

Filed May 9, 1969, Ser. No. 823,404
Claims priority, application Germany, May 11, 1968, P 17 55 462.0
Int. Cl. B60g 9/02
U.S. Cl. 280—124 26 Claims



An axle suspension, in particular a rear axle suspension for motor vehicles, in which each rear wheel is suspended at the vehicle superstructure by two guide members, disposed one above the other, of which one guide member extends substantially in one direction of the vehicle while the other guide member extends in the opposite direction; one guide member of each vehicle side is connected with the wheel carrier in a substantially hingelike manner, and these two guide members are connected with each other so as to pivot in unison about a substantially transversely extending axis.

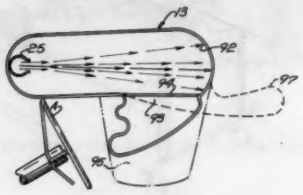
### 3,586,347
### SAFETY DEVICE

William R. Carey, Farmington, and David P. Hass, Detroit, both of, Mich., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio

Division of Ser. No. 661,598, Aug. 18, 1969, Pat. No. 3,473,824.
Filed June 5, 1969, Ser. No. 830,837
Int. Cl. B60r 21/10
U.S. Cl. 280—150 5 Claims

A safety device comprises an inflatable confinement. The inflatable confinement has a contracted position and an expanded position and is inflated to its expanded position by the flow of fluid into the confinement. The kinetic energy of the initial fluid flow into the confinement is absorbed by

energy-absorbing means. The absorption of the initial kinetic energy of the fluid flowing into the confinement minimizes the impact of the fluid on a forward portion of the confinement, and thus minimizes the impact of the confinement against an occupant of the vehicle during the initial stages of the inflation of the confinement.



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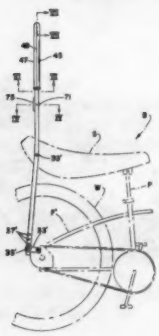
**3,586,348**

**BICYCLE SIGN - SEAT BRACE MEANS**

**Maurice E. Rich, Jr., Memphis, Tenn., assignor to Troxel Manufacturing Company, Moscow, Tenn.**

**Filed Sept. 17, 1968, Ser. No. 761,399**
**Int. Cl. B02j** *39/00*
**U.S. Cl. 280—289** **2 Claims**



A sign-seat brace assembly adapted for installation on a bicycle—the invention including brace structure extending upwardly from the bicycle rear wheel axis and supporting the rear of an elongated bicycle seat. The seat brace structure projecting upwardly mastlike and having generally flat circular sign means elevatingly positioned and arranged behind the back of a bicycle rider. The sign means having a generally taut sheeting or fabric sign-bearing surface. The sign-bearing surface being optionally (1) formed with a luminous bright-colored surface to attract attention and communicate a warning signal; (2) formed with indicia thereon for attracting attention and communicating an intelligible message; or (3) having both a bright-colored surface and indicia formed on the surface for communicating both a warning signal and an intelligible message.

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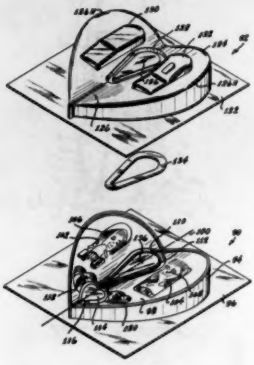
**3,586,349**

**DOLL PACKAGE**

**James R. Green, Long Beach, and Gary E. Phillips, Encino, both of, Calif., assignors to Mattel, Inc., Hawthorne, Calif.**

**Filed Mar. 26, 1969, Ser. No. 810,651**
**Int. Cl. B42d** *3/00*
**U.S. Cl. 281—31** **7 Claims**

A doll package comprising a heart-shaped doll case for holding a boy and girl doll in related clothes and a book member with an aperture in the front cover for displaying the



case, the book member having inner pages that contain a romance story about the boy and girl dolls.

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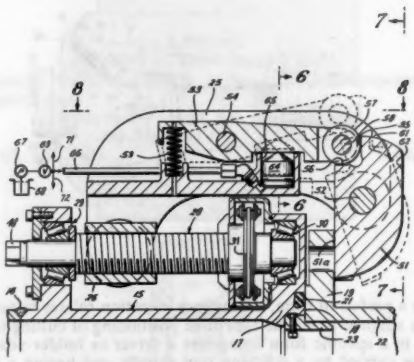
**3,586,350**

**COUPLER**

**Albert A. Ashton, Dallas, Tex., assignor to Youngstown Sheet and Tube Company, Youngstown, Ohio**

**Filed May 23, 1969, Ser. No. 827,412**
**Int. Cl. F16l** *35/00*
**U.S. Cl. 285—24** **10 Claims**



This patent discloses a coupler for coupling a loading arm to a pipe flange in which jaw assemblies reach around a ship's pipe flange to engage the flange and draw the coupler into sealing engagement therewith. Provisions are made for perfecting a seal with misalignment of the coupler and the ship's manifold and for quick release of the coupler from the manifold in the event of emergency.

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**3,586,351**

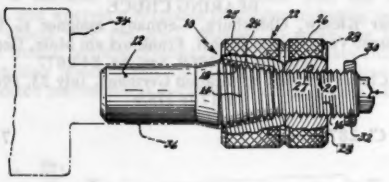
**ADAPTER FITTING FOR CONTAINERS HAVING A FLEXIBLE OUTLET**

**John E. Vanderveen, and Hans B. Bartholomew, both of San Antonio, Tex.**

**Filed June 25, 1969, Ser. No. 836,353**
**Int. Cl. F16l** *15/00*
**U.S. Cl. 285—89** **8 Claims**

An adapter fitting for use with a container having a flexible outlet. The adapter fitting has a hollow cylindrical plug in-

tegral with a hollow tapered threaded fitting and a hollow cylindrical threaded fitting. In use the cylindrical plug and tapered threaded fitting of the adapter fitting are inserted



within the flexible outlet and a locking nut sized to the threaded fittings is screwed thereon fixedly holding the flexible outlet in place.

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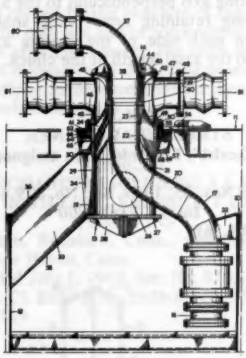
**3,586,352**

**SWIVEL STRUCTURES FOR MOORING BUOYS OR THE LIKE**

**August Hendrik Maria Smulders, Wassenaar, Netherlands, assignor to Single Buoy Mooring Inc., Zug, Switzerland**

**Filed Oct. 14, 1968, Ser. No. 767,217**
**Int. Cl. F16l *39/04***
**U.S. Cl. 285—134** **2 Claims**



A swivel for a mooring buoy for simultaneously transferring at least two fluids to or from a vessel, comprises a fixed swivel body and a relatively rotatable swivel head with concentric duct ends that meet at horizontal bearing faces with circular packing rings between them. A concentric bearing spaced from these concentric bearing surfaces is adapted to bear both radial and axial loads. This last bearing has a rotatable member which is releasably secured to the swivel head by bolts which provide the only means for tightening down the swivel head on the packing rings.

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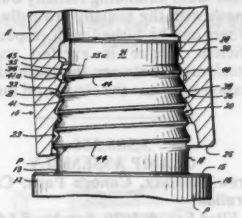
**3,586,353**

**THREAD ARRANGEMENT FOR EARTH BORING MEMBERS**

**Howard I. Lorenz, and Kees M. Verheul, both of P.O. Box 9582, Houston, Tex.**

**Filed Jan. 13, 1969, Ser. No. 790,699**
**Int. Cl. F16l *25/00***
**U.S. Cl. 285—334** **14 Claims**

A thread arrangement for connecting solid, or essentially solid shafts, as well as shafts having a longitudinal bore extending therethrough for use in earth boring operations, which thread arrangement is defined in terms of the geometry, including the diameters, of the shafts upon which



the thread is employed, rather than in specific, or absolute, unchangeable dimensions.

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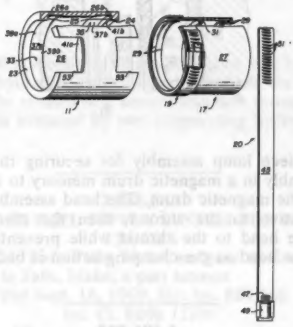
**3,586,354**

**PIPE COUPLING**

**Allan J. Boscacci, 2160 Manzanita Drive, Oakland, Calif.**

**Filed May 20, 1969, Ser. No. 826,157**
**Int. Cl. F16l *17/02***
**U.S. Cl. 285—369** **4 Claims**



Pipe coupling incorporating a resilient cylindrical gasket for surrounding adjacent pipe ends. Band clamps secure the gasket to the pipe sections. A rigid housing is provided for receiving both the band clamps in each end thereof and the gasket, the housing being arranged to encircle and accommodate within itself both the clamps and the gasket in a unitary, easy-to-install structure.

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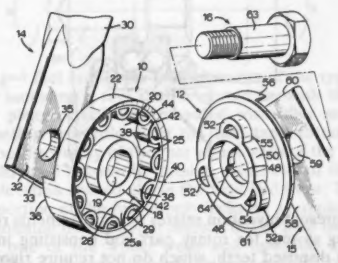
**3,586,355**

**HINGE JOINT ASSEMBLIES**

**Hugo Magi, Etobicoke, Ontario, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Ontario, Canada**

**Filed Jan. 13, 1969, Ser. No. 790,600**
**Int. Cl. F16c *11/10***
**U.S. Cl. 287—14** **8 Claims**



A hinge joint assembly for pivotally connecting two structural members together. The assembly includes two lock

members, one connected to each structural member. One lock member has teeth extending radially inwardly toward the pivot axis of the two structural members, and the other lock member has teeth extending radially outwardly from the pivot axis to mesh with the radially inwardly extending teeth. The lock members can be turned with respect to one another provided sufficient torque is exerted to overcome the mechanical interference between the teeth, thus changing the relative orientation between the structural members.

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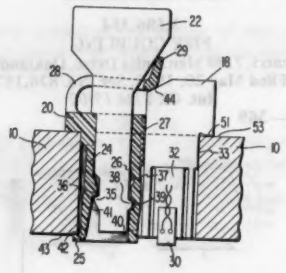
**3,586,356**
**CLAMP ASSEMBLY**

**Anthony Andrew Smalarz, Canoga Park, Calif., assignor to RCA Corporation**

**Filed Feb. 4, 1970, Ser. No. 8,645**
**Int. Cl. F16b 9/00**
**U.S. Cl. 287—20.3** **16 Claims**



A two-piece lamp assembly for securing the transducer head assembly in a magnetic drum memory to a shroud surrounding the magnetic drum. The head assembly is first adjusted relative to the shroud, then the clamp assembly secures the head to the shroud while preventing misalignment of the head as the clamping action is becoming effective.

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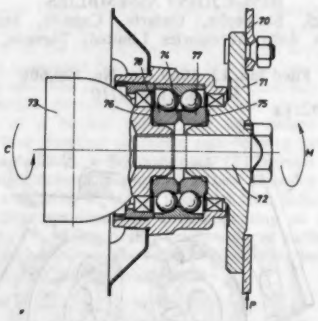
**3,586,357**
**COUPLING SYSTEM FOR ROTARY PARTS SUCH AS BALL RACES OR THE LIKE**

**Michel Orain, Courbevoie, France, assignor to Societe Anonyme: Glaenzer Spicer, Poissy, France**

**Filed June 16, 1969, Ser. No. 833,291**
**Claims priority, application France, June 24, 1968, 156,349**
**Int. Cl. F16d 1/06**
**U.S. Cl. 287—53 R** **6 Claims**



The present invention relates to improvements relating to a coupling system for rotary part and consisting in providing radially disposed teeth, which do not require rigorous precision of manufacture on the side surfaces adapted to be engaged of the parts to be coupled, independently of the conventional assembling means of same, the teeth having identical characteristics to engage one another and provide angular wedging of the parts and relative centering with respect to the axis of rotation.

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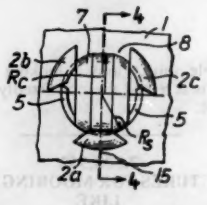
**3,586,358**
**BEARING CHUCK**

**Lothar Kiesow, Oldenburg, Germany, assignor to Licentia Patent-Verwaltungs GmbH, Frankfurt am Main, Germany**

**Filed July 23, 1969, Ser. No. 844,077**
**Claims priority, application Germany, July 23, 1968, P 17 75 275.9**
**Int. Cl. F16c 11/06**
**U.S. Cl. 287—88** **7 Claims**



A hole in a bearing chuck is seated in a glass-fiber-reinforced plastic plate and held tightly by retaining arms positioned around the hole and extending from the face of the plate. As measured when in its seated position, the chuck has a predetermined axial length parallel to the axis of the hole. The chuck is inserted and withdrawn between two adjoining retaining arms in a position rotated 90° from the seated position about a seating axis perpendicular to the axis of the hole, the two adjoining retaining arms being spaced from one another, one on each side of the seating axis, at least a distance equal to the axial length of the chuck.

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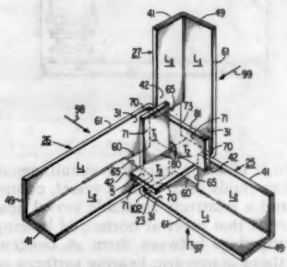
**3,586,359**
**STRUCTURAL CORNER**

**Edward Peter Cecelski, Freehold, N.J., assignor to RCA Corporation**

**Filed Nov. 25, 1969, Ser. No. 879,688**
**Int. Cl. F16b 7/00**
**U.S. Cl. 287—189.36B** **11 Claims**



A corner frame construction in which three angle members, each having an identical end configuration, are joined in interlocking relation at their ends to form a corner having a smooth and rigid external surface.

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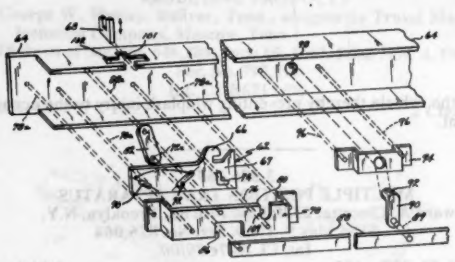
**3,586,360**
**LATCH MECHANISM**

**Joseph W. Perrotta, Elyria, Ohio, assignor to The Langenau Manufacturing Company, Cleveland, Ohio**

**Filed June 27, 1969, Ser. No. 837,032**
**Int. Cl. E05c 9/10, 19/10**
**U.S. Cl. 292—26** **8 Claims**

A simplified, compact catch mechanism for latching separable wall portions together, such as for instance in a

casket or other container, and comprising in one embodiment a latch member which coacts with a longitudinally movable slide member and which is movable vertically with respect to the slide member but has substantially no lengthwise movement with respect to the slide member but instead is movable lengthwise as a unit with the slide member, and wherein a rotatable controller including an eccentric coacts with the latch member to move the latch member from a latching position upwardly and rearwardly to an unlatching position and vice versa; in another embodiment a catch mechanism is disclosed which comprises a latch



member which is movable vertically and lengthwise with respect to a support and is actuated by a pivotal arm actuator which includes an actuating cam pin extending into coaction with a cam slot so that the latch member in moving from an unlatched to a latched condition moves lengthwise and then downwardly as caused by the coaction of the cam pin on the actuator with the cam slot and in conjunction with other cam and slot means coacting between the latch member and the support, and in moving to an unlocking position is tipped or pivoted upwardly at its forward end and then is moved rearwardly to unlatched condition.

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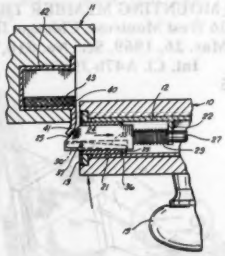
**3,586,361**

**LATCH MECHANISM INCLUDING A LATCH BOLT HAVING BOTH LONG AND SHORT EXTENDED POSITIONS**

**Richard J. Ohno, Branford, Conn., assignor to Sargent & Company, New Haven, Conn.**

**Filed July 1, 1969, Ser. No. 838,197**
**Int. Cl. E05c *1/12*; E05b *63/20*, *15/02***
**U.S. Cl. 292—169** **6 Claims**



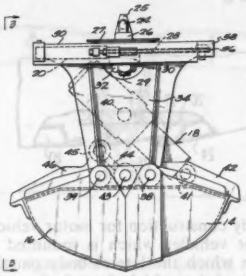
There is provided a latch bolt spring urged in a direction to be extended and capable of retraction by conventional retractor means, which has both long and short extended positions for cooperation with a strike. The bolt is releasably retained in the short position by a movable catch member operative to engage and hold the bolt in the last-mentioned position. A magnet is employed in association with the strike to release the catch member so that the bolt may assume its fully extended or long position in the strike.

**3,586,362**

**CLAMSHELL ASSEMBLY**

**Sam Kramer, 2591 South Root River Parkway, West Allis, Wis.**

**Filed July 15, 1968, Ser. No. 744,926**
**Int. Cl. B66c *3/02***
**U.S. Cl. 294—70** **3 Claims**



A clamshell assembly in which both jaws may be actuated by a single hydraulic cylinder and in which the entire assembly may be rotated in a horizontal plane through a chain drive which is actuated by two cooperating hydraulic cylinders.

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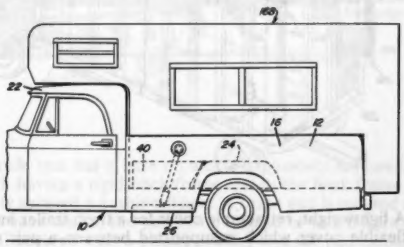
**3,586,363**

**EXPANDED FUEL SUPPLY SYSTEM FOR PICKUP TRUCKS**

**Emil T. Omlid, Twin Falls, Idaho, assignor to Gary M. Wolverton, Twin Falls, Idaho, a part interest**

**Filed Sept. 18, 1969, Ser. No. 859,066**
**Int. Cl. B60k *15/06***
**U.S. Cl. 296—1R** **8 Claims**



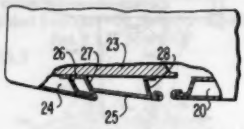
An enlarged fuel supply for pickup trucks of the type conventionally including a fuel tank mounted beneath the load bed of the pickup truck and provided with filler and vent pipes projecting upwardly from the fuel tank through the load bed floor forwardly of the rear wheel wells of the pickup truck and directed outwardly through a sidewall of the load bed at an elevation spaced above the load bed floor. The enlargement portion of the fuel supply includes a supplemental fuel tank mounted on the upper surface of the load bed floor forward of one of the wheel wells and upwardly through which the filler and vent pipes of the conventional tank extend with the top and bottom walls of the supplemental tank sealed relative to the adjacent outer surfaces of the pipes and the latter vented to the interior of the supplemental tank.

3,586,364

## VEHICLE BODY CONSTRUCTION SECURED AT THE SUPPORT STRUCTURE OF A MOTOR VEHICLE

Karl Wilfert, Gerlingen-Waldstadt, and Bela Barenyi, Stuttgart-Vaihingen, both of, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Nov. 15, 1968, Ser. No. 776,020
Claims priority, application Germany, Nov. 15, 1967, P 16 30-386.9
Int. Cl. B62d 25/02
U.S. Cl. 296—28 R 22 Claims



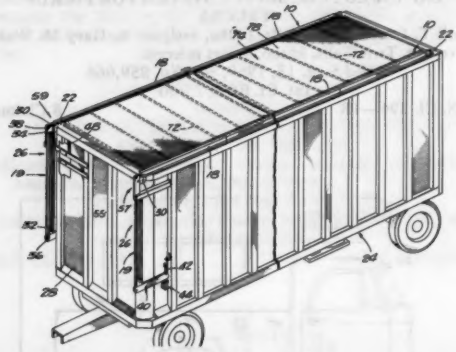

A vehicle body construction for motor vehicles, especially passenger motor vehicles which is mounted on a support structure and in which the lateral body panels in the front and/or rear area of the vehicle from in front the rear up to the door, consist of at least two separate parts.

3,586,365

## RETRACTABLE LOAD COVER FOR A VEHICULAR CONTAINER

Rufus F. Dickson, 525 Arbolado Drive, Fullerton, Calif., and Lawrence C. Funder, 7845 East Eighth St., Downey, Calif.

Filed Sept. 11, 1969, Ser. No. 857,183
Int. Cl. B60j 7/10
U.S. Cl. 296—137 G 10 Claims



A lightweight, retractable cover for a trash trailer including a flexible cover which is supported between a pair of conveyor chains. A pair of straight tracks are provided on the upper longitudinal edges of the trash trailer for supporting the cover in its closed position. A pair of folding pathways are provided for the conveyor chains on the front end of the trailer, these pathways being aligned in a generally vertical plane, so that the top of the trailer may be opened by drawing the cover forward and thence down the front of the trailer into a folded up position. The chains are driven in reverse to return the cover to its closed position.

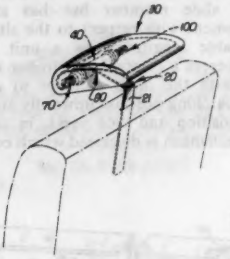
3,586,366

## INERTIA-RESPONSIVE RETRACTABLE HEAD RESTRAINT DEVICE

Lawrence M. Patrick, Detroit, Mich., assignor to American Safety Equipment Corporation, New York, N.Y.

Filed Apr. 21, 1969, Ser. No. 817,632
Int. Cl. A47c 7/36, 7/42
U.S. Cl. 297—391 8 Claims

An inertia-responsive retractable head restraint device for use in conjunction with a vehicle seat back to prevent rearward motion of an occupant's head upon rapid acceleration of the vehicle thereby preventing whiplash injury to the occupant.

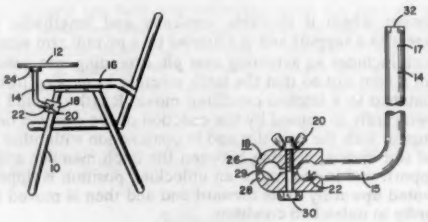



3,586,367

## MULTIPLE POSITION TRAY APPARATUS

Edward A. Cincotta, 2330 East 74th St., Brooklyn, N.Y.

Filed May 9, 1969, Ser. No. 826,064
Int. Cl. A47c 39/00
U.S. Cl. 297—162 3 Claims




A multiple position tray apparatus having a tray with a recess in the bottom surface thereof for coacting with one end of a curved arm that fits in said recess and holds said tray, with the other end of the arm having an adjustable connector that is swiveled on the end of the arm and has means for being adjustably attached to the arm or leg of a lawn chair holding the tray in a horizontal position regardless of the angular position of the particular part of the lawn chair to which the tray is secured and supported.

3,586,368

## TRAY AND MOUNTING MEMBER THEREFOR

Leigh S. Guild, 6216 West Montrose, Chicago, Ill. 60634

Filed Mar. 26, 1969, Ser. No. 810,709
Int. Cl. A47b 39/00
U.S. Cl. 297—135 4 Claims

A tray for holding food, beverages and the like which is pivotably connected to a mounting plate having spring

clamps thereunder for quickly mounting the plate and tray to the arm of a chair in a secure but nonpermanent manner. The tray is mounted to the plate at an offcenter pivot point which allows the tray to be swung in over the seat of the chair in a position convenient to a person sitting in the chair and swung out of the way to the side of the chair to allow ease of access in and out of the chair. In a preferred embodiment, the tray includes a holder for a cup or glass to prevent spillage therefrom during swiveling of the tray.

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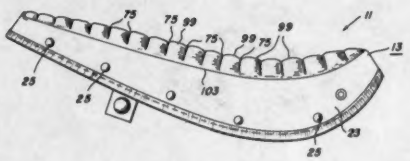
**3,586,369**
**METHOD OF MAKING A BICYCLE SEAT AND RESULTING PRODUCT**

**George W. Worley, Bolivar, Tenn., assignor to Troxel Manufacturing Company, Moscow, Tenn.**

**Division of Ser. No. 646,289, June 15, 1967. Filed Nov. 4, 1968, Ser. No. 797,297**
**Int. Cl. B62j** *1/00*
**U.S. Cl. 297—195** **2 Claims**




A method of making a bicycle seat including the steps of providing a rigid base; providing a top assembly having a toppiece of a lightweight flexible vinyl and having an edge portion around the periphery thereof, providing a continuous side formed of a vinyl substantially stiffer than said lightweight flexible vinyl, heat-sealing said continuous side to said lightweight flexible vinyl along said edge portion to establish a covering and securing said covering to said base by attaching said continuous side to said base.

A bicycle seat having a rigid base, a top assembly having a toppiece of a lightweight flexible vinyl, a continuous side of a vinyl that is substantially stiffer than said lightweight flexible vinyl, said side being bonded to said top assembly and being attached to said rigid base.

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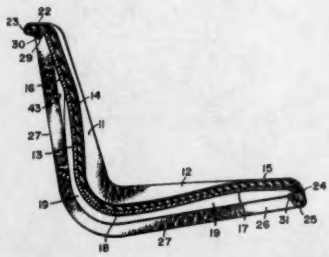
**3,586,370**
**UPHOLSTERED CHAIR**

**Chester J. Barecki, and Arthur J. Hogan, Jr., both of Grand Rapids, Mich., assignors to American Seating Company, Grand Rapids, Mich.**

**Filed Dec. 4, 1968, Ser. No. 781,020**
**Int. Cl. A47c** *3/00, 7/02*
**U.S. Cl. 297—219** **2 Claims**

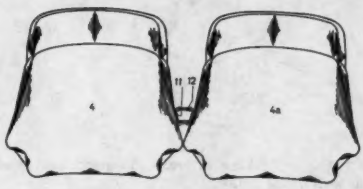



A chair is provided with an upholstery cover which is held in place by fasteners which are concealed from view. The edges of the cover are folded back and sewn or otherwise secured to provide sleeves which receive rods, and the cover is pulled over the sides of the chair and evenly stretched by the rods which are held by a plurality of fasteners secured to the underside of the chair.

**3,586,371**
**SEATING ARRANGEMENT**

**Alfred Baetzner, Karlsruhe; Helmut Baetzner, Karlsruhe, and Kurt Tischer, Ilsfeld, all of, Germany, assignors to Baresel-Bofinger, Rudolf, Ilsfeld near Hulbronn, Germany**

**Comtinuation-in-part of application Ser. No. 622,736, Mar. 13, 1967. This application Feb. 17, 1969, Ser. No. 840,067**
**Int. Cl. A47c** *1/124*
**U.S. Cl. 297—248** **12 Claims**




A one-piece stackable chair consists of reinforced synthetic plastic material having a wall thickness of at least 3 mm., and preferably ranging between at least 3 and 6 mm. Coupling means is provided for coupling any two such chairs releasably to one another so that at the will of a user such chairs may be arranged side-by-side in coupled relationship, or the coupling may be disengaged and the chairs may be stacked.

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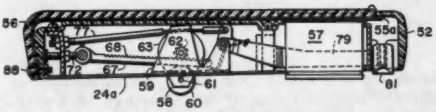
**3,586,372**
**RECLINER VEHICLE SEAT**

**Chester J. Barecki, Grand Rapids, and Kenneth W. Hozeski, Grandville, both of, Mich., assignors to American Seating Company, Grand Rapids, Mich.**

**Filed Nov. 18, 1968, Ser. No. 776,470**
**Int. Cl. B60n** *1/06*
**U.S. Cl. 297—359** **4 Claims**




A vehicle seat has a base on which is pivotally mounted a seat back having a rigid back frame and to the back frame is releasably secured a cushion frame. A crash pad is secured to the rigid back frame, the pad being formed of thin deformable metal covered with a plastic coating and the pad extending over and interlocking with the frame top. A torsion spring in the frame urges the seat back forwardly and locking mechanism is controlled by safety release means in the arm rest. Cushion panels protect the knee-striking area. A foot rest is supported for movement following the contour of adjacent portions of the seat and back.

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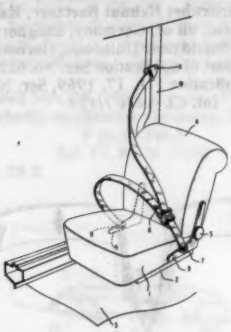
**3,586,373**
**ARRANGEMENT FOR THE ANCHORING OF SAFETY BELTS IN MOTOR VEHICLES**

**Willi Reidelbach, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany**

**Filed May 21, 1969, Ser. No. 826,340**
**Claims priority, application Germany, May 21, 1968, P 17 55 539.4**
**Int. Cl. A62b** *35/60*
**U.S. Cl. 297—389** **7 Claims**

An anchoring arrangement for a safety belt, especially a

Three-point safety belt, in which the lower end or ends are



anchored at the seat frame whereas the upper end is secured at a lateral wall of the body.

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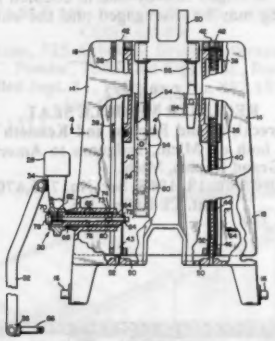
**3,586,374**
**DENTAL CHAIR**
**Fritz B. Laessker, Fairport, N.Y., assignor to Sybron Corporation, Rochester, N.Y.**
**Filed Dec. 8, 1969, Ser. No. 882,897**
**Int. Cl. A47c** *5/04, 7/12, 7/54*
**U.S. Cl. 297—421** **10 Claims**



Disclosed is a dental chair which can be adjusted to suit different body sizes ranging from children to average-size adults wherein the length of the backrest portion of the chair can be increased or decreased and wherein the arms of the chair are adjustable outwardly from the chair to increase the distance across the seat portion between the armrests or, if desired, the armrests can be removed.

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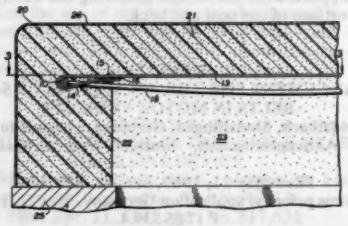
**3,586,375**
**SPRING AND FOAM SEAT CONSTRUCTION**
**Alan E. Rathbun, 3135 Highland Drive, Cuyahoga Falls, Ohio**
**Filed Jan. 13, 1969, Ser. No. 790,690**
**Int. Cl. A47c** *7/18*
**U.S. Cl. 297—452** **8 Claims**



A spring and foam seat construction comprising a spring suspension having opposite side frame rods with spaced bands or straps extending between and connected to said rods and at least one bowed compression spring rod with its ends abutting said rods, and resilient foam material under said side frame rods and forming the sole means for supporting said spring suspension.

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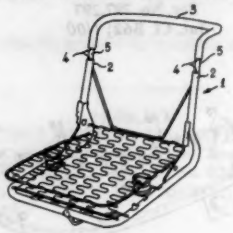
**3,586,376**
**SAFETY SEAT OF VEHICLES**
**Noel Le Mire, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt, France and Automobiles Peugeot, Paris (Seine), France**
**Filed Apr. 3, 1969, Ser. No. 813,103**
**Claims priority, application France, Apr. 4, 1968, 147018**
**Int. Cl. A47c** *7/02;* **B60r** *21/00;* **B60n** *1/02*
**U.S. Cl. 297—452** **1 Claim**



A vehicle seat having an impact-absorbing back formed by upright members interconnected by a transverse bar. The upright members are formed in sections assembled on sleeves and held by retaining means in a normal position. The back will deform upon application of a force thereto by the sections sliding into the sleeves when the force overcomes the retaining means.

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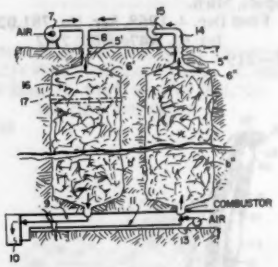
**3,586,377**
**METHOD OF RETORTING OIL SHALE IN SITU**
**Rex T. Ellington, Tulsa, Okla., assignor to Atlantic Richfield Company, New York, N.Y.**
**Filed June 10, 1969, Ser. No. 831,945**
**Int. Cl. E21b** *43/26;* **E21c** *43/00*
**U.S. Cl. 299—4** **9 Claims**



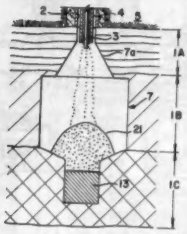

This invention relates to a process for the recovery of oil from an underground, unmined zone of oil shale. Access is obtained at at least two points in the zone, which can be, for example, in a shallow zone, near the top and bottom of the zone, communication is established between the access means, and at least part of the oil shale zone is fragmented. The heat of retorting is supplied through one of the access means, as by a gas, and the pyrolyzed oil is recovered from the other access means.

3,586,378

## METHOD FOR RECOVERING SALT FROM A SUBSURFACE EARTH FORMATION BY SOLUTION MINING

Daniel N. Dietz, Rijswijk South Holland, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Filed July 7, 1969, Ser. No. 839,540
Claims priority, application Netherlands, Feb. 20, 1969, 6902652
Int. Cl. E21b 43/28
U.S. Cl. 299—5 13 Claims




A method for the recovery of salt from a subsurface earth formation containing salt therein by circulating an aqueous liquid through the formation to form a cavity therein. The salt dissolved in the aqueous liquid is removed from the cavity and a solid substance, such as sand, is circulated into the cavity in an amount sufficient to form a pile of a height filling a substantial portion of the cavity and displace the salt-containing liquid remaining in the cavity prior to closing in the cavity.

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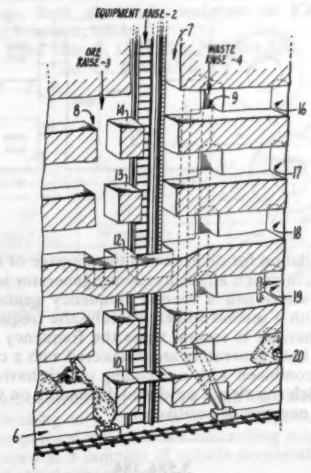
3,586,379

## MINING METHOD

Charles A. R. Lambly, San Francisco, Calif., assignor to Bechtel International Corporation

Filed Sept. 24, 1969, Ser. No. 860,511
Int. Cl. E21c 41/00
U.S. Cl. 299—8 4 Claims




A method of mining an ore body in which a haulage level is established in the ore body and separate raises are driven into the ore body for men and equipment, ore and waste. The ore body is classified as it is mined for movement as either ore or waste through the appropriate raise for separate removal from the haulage level.

3,586,380

## METHOD OF PRODUCING AN IMPROVED SWAB

Galib-bey Alibeckoff, Lakewood, Ohio, assignor to Nylonge Corporation, Cleveland, Ohio

Filed Nov. 12, 1968, Ser. No. 774,685
Int. Cl. A61f 13/00
U.S. Cl. 300—21 2 Claims

A swab comprises a stick having a teardrop-shaped nonwoven mass of cotton fibers on an end thereof covered by an adherent sheath of regenerated cellulose sponge. The swab is produced by dipping the stick mounted cotton mass into viscose containing particulate sodium sulfate to form a coating, and then coagulating and regenerating the cellulose in the coating.

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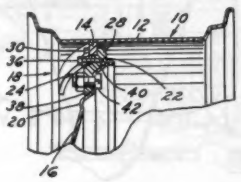
3,586,381

## RIM CLAMP FOR ADJUSTABLE TREAD WHEEL

Howard P. Siegel, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Aug. 28, 1969, Ser. No. 853,853
Int. Cl. B60b 23/12
U.S. Cl. 301—9 4 Claims




A rim clamp for an adjustable tread wheel body wherein the clamp has a body with double ramps for urging the body axially outward into firm engagement with a rail of the wheel rim and a clamping element cooperating with an integral lug on the body to axially clamp the body to the rim.

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3,586,382

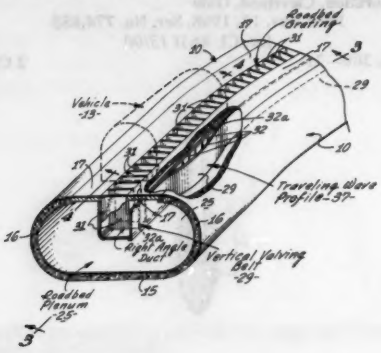
## TRANSPORTATION SYSTEM

Alan R. Pitkanen, 2481 Bayshore Drive, Newport Beach, Calif.

Filed Oct. 9, 1969, Ser. No. 865,101
Int. Cl. B65g 53/04
U.S. Cl. 302—29 8 Claims

An improved transportation system is provided by which vehicles, or articles in general, may be propelled along a roadbed on a cushion of pressurized fluid. The roadbed is provided with a grating which defines a series of vents through which the pressurized fluid escapes. The inner surface of the grating is normally closed by a flexible belt which extends along the roadbed, and in which a traveling wave is introduced progressively to open the vents and permit the

fluid to escape and thus support and propel the vehicle. The system and apparatus to be described includes such a belt




disposed in a vertical plane for reasons to become apparent as the description proceeds.

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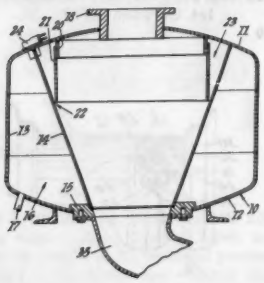
**3,586,383**

**PNEUMATIC MATERIAL HANDLING APPARATUS**

**William John Courtney Trythall, 6 Oakville Mansion, Devonshire Road, Southampton, England**

**Filed Oct. 18, 1968, Ser. No. 768,854**
**Claims priority, application Great Britain, Oct. 24, 1967, 48322/67**
**Int. Cl. B65g** *53/40*
**U.S. Cl. 302—53** **7 Claims**



A material-handling apparatus comprising a compressed air reservoir within which is a material supply vessel interconnecting the upper and lower ends of the air reservoir to strengthen the air reservoir against bursting. The supply vessel has a closable upper opening through which it can receive material and a lower opening through which the material can be discharged by closing said upper opening and then permitting compressed air from the air reservoir to enter the supply vessel near its upper end. To avoid the use of pipes to interconnect the compressed air reservoir with the material supply vessel, the interior of the compressed air reservoir communicates with the interior of the material supply vessel directly through one or more valve members in the wall or walls of the material supply vessel.

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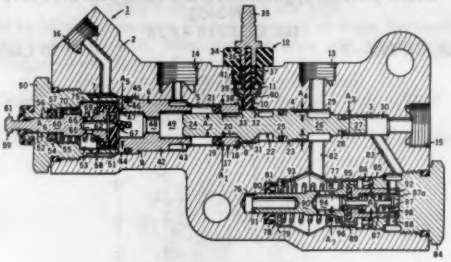
**3,586,384**

**CONTROL VALVE**

**Edward J. Falk, St. Louis, Mo., assignor to Wagner Electric Corporation, Newark, N.J.**

**Filed July 11, 1969, Ser. No. 841,045**
**Int. Cl. B60t** *8/26, 11/34, 17/18*
**U.S. Cl. 303—6C** **18 Claims**

A driver-warning-type control valve is provided with a passage connected in bypass relation with a proportioning valve, and a switch actuating piston for controlling said passage is movable between a normally centered position and opposed translated positions in response to separate fluid pressures supplied thereto and the proportionally reduced fluid pressure from the proportioning valve assisting one of the supplied fluid pressures. A centering piston is subjected



to the other of the supplied fluid pressures and engageable with said switch actuating piston to normally urge said switch actuating piston toward its centered position and oppose movement thereof toward one of its opposed translated positions for opening the bypass passage. And a metering valve is also subjected to the other supplied fluid pressure for effecting a metered application thereof through said control valve.

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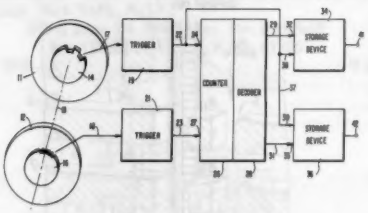
**3,586,385**

**INSTALLATION FOR DETERMINING THE SLIPPAGE OF MOTOR VEHICLE WHEELS**

**Hans Jorg Florus, Goeppingen, and Horst Grossner, Geradstetten, Wurttemberg, both of, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertuerkheim, Germany**

**Filed May 8, 1969, Ser. No. 822,970**
**Claims priority, application Germany, May 8, 1968, P 17 73 376.5**
**Int. Cl. B60t** *8/08*
**U.S. Cl. 303—21BE** **8 Claims**




An installation for determining the slippage of motor vehicle wheels, in which a first frequency generator is associated with one wheel and a second frequency generator is associated with a second wheel, whereby the frequency of the second generator is several times the frequency of the first generator; both generators are connected with a counter that in turn is combined with a decoding circuit having two outputs in which signals are produced depending on whether the slippage is negative or positive.

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**3,586,386**

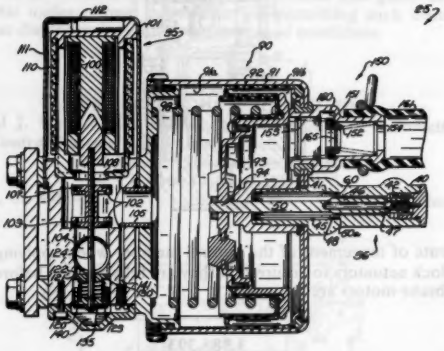
**ANTI-SKID BRAKE CONTROL AND ACTUATOR ASSEMBLY**

**Claude M. Trocme, Birmingham, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio**

**Filed Mar. 7, 1969, Ser. No. 805,155**
**Int. Cl. B60t** *8/08*
**U.S. Cl. 303—21** **9 Claims**

An antiskid brake system includes a control and actuator assembly operable to relieve the pressure in at least a portion of the brake system in circular to the vehicle encountering a

skid condition. The control and actuator assembly includes an actuator unit having a control member movable to relieve the brake pressure and a servomotor operable to effect the movement thereof. The servomotor includes a pressure operated member having a normal position and which is movable therefrom in response to a pressure differential acting on the opposite sides thereof. The pressure operated member is connected with the control member so that these members move together. A control valve controls the pressure on one side of the pressure operated member and applies atmospheric pressure to the one side of the pressure operated member when the pressure operated member is in its normal position. The control valve is operable in response to the receipt of a skid signal to apply a vacuum to the one side of the pressure operated member. A pressure responsive valve controls the pressure on the other side of the pressure operated member and is responsive to movement of the pressure operated member.



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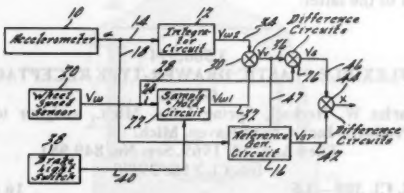
**3,586,387**

**SKID CONTROL SYSTEM**

**Hugh E. Riordan, Ann Arbor, and Frank L. Moncher, Farmington, both of, Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.**

**Filed Mar. 5, 1969, Ser. No. 804,436**
**Int. Cl. B60t** *8/10, 8/12*
**U.S. Cl. 303—21 B** **8 Claims**




A skid control system for wheeled vehicles which operates to control braking as a function of the magnitude of slip speed and/or percent slip with the controlling magnitude of slip being varied as a function of vehicle deceleration and as a function of vehicle speed.

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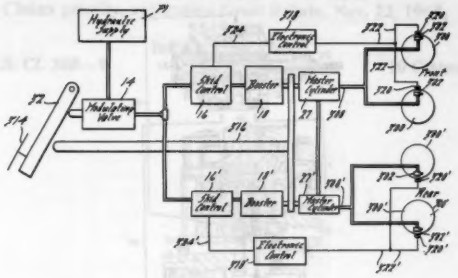
**3,586,388**

**SKID CONTROL SYSTEM**

**William Stelzer, Milford, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.**

**Filed Oct. 8, 1968, Ser. No. 765,787**
**Int. Cl. B60t** *8/12, 8/26*
**U.S. Cl. 303—21F** **31 Claims**

A skid control system for fluid actuated brakes of a wheeled vehicle which brakes are actuated by a fluid energized power booster and including a modulating valve for modulating the fluid pressure to the power booster whereby the pressure to the fluid actuated brakes will be modulated.



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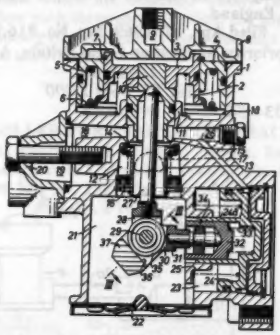
**3,586,389**

**APPORTIONING VALVES FOR BRAKING SYSTEMS**

**Wilbur Mills Page, Bracebridge Heath, Lincoln, and Ralph Coupland, Lincoln, both of, England, assignors to Clayton Dewandre Company Limited, Lincoln, England**

**Filed Jan. 24, 1969, Ser. No. 793,763**
**Claims priority, application Great Britain, Jan. 29, 1968, May 16, 1968, 4489/68;23374/68**
**Int. Cl. B60t** *8/18, 15/00*
**U.S. Cl. 303—22** **13 Claims**



An apportioning valve for use in an air pressure braking system, comprises piston means responsive to brake line or signal pressure, valve means actuated directly by the piston means and controlling airflow to the brake actuators, and a reaction piston responsive to the generated braking pressure and acting on the valve means in opposition to the piston means, said reaction piston acting through a member riding on an inclined plane the angle of which varies with vehicle load thereby varying the degree of reaction for a given braking effort.

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**3,586,390**

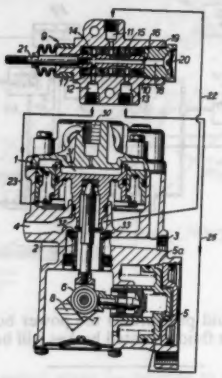
**AIR PRESSURE BRAKING SYSTEMS**

**Wilbur M. Page, and Ralph Coupland, both of Lincoln, England, assignors to Clayton Dewandre Company Limited, Lincoln, England**

**Filed May 14, 1969, Ser. No. 824,587**
**Claims priority, application Great Britain, May 16, 1968, 23,375/68**
**Int. Cl. B60t** *8/18, 13/26*
**U.S. Cl. 303—22** **7 Claims**

In an air pressure braking system comprising a combined apportioning valve and relay emergency valve in which an

input piston structure is responsive at one side to a signal pressure and at the other side to a force exerted by a reaction piston and action through means variable in accordance with



vehicle load, a cutout valve is provided operable at will to interrupt the application of braking pressure to the reaction piston and to direct it to said other side of the input piston.

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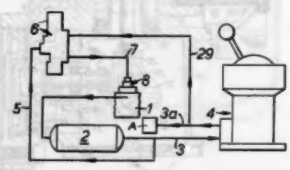
**3,586,391**

**FLUID PRESSURE OPERATED BRAKING SYSTEMS**

**George K. Farmery, and Neville Turner, both of Lincoln, England, assignors to Clayton Dewandre Company Limited, Lincoln, England**

**Filed Apr. 17, 1969, Ser. No. 816,993**
**Claims priority, application Great Britain, Apr. 22, 1968, 18911/68**
**Int. Cl. B60t** *15/00*
**U.S. Cl. 303—54** **2 Claims**



In a compressed air operated braking system in which the brake motors are fitted with lock actuators and in which the compressor incorporates unloader means actuated by a governor valve responsive to reservoir pressure, movement of a control member to render the lock actuators inoperative also effects delivery of compressed air to the governor valve to augment the spring loading thereof and so temporarily establish a higher pressure in the system for releasing the lock actuators.

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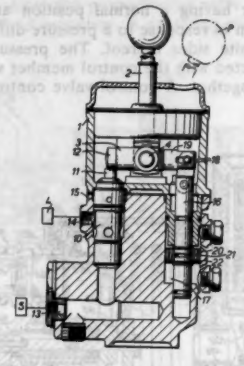
**3,586,392**

**FLUID OPERATED BRAKING SYSTEMS**

**Donald H. Ballard, and George K. Farmery, both of Lincoln, England, assignors to Clayton Dewandre Company Limited, Lincoln, England**

**Filed Apr. 17, 1969, Ser. No. 816,958**
**Claims priority, application Great Britain, Apr. 22, 1968, 18910/68**
**Int. Cl. B60t** *15/00*
**U.S. Cl. 303—89** **4 Claims**

In a compressed air operated braking system in which the brake motors are fitted with lock actuators for parking purposes and in which a control member, after moving to effect application of the lock actuators, then moves to exhaust the brake motors, damper means are provided for limiting the



rate of movement of the control member when applying the lock actuators to ensure that they are fully applied before the brake motors are exhausted.

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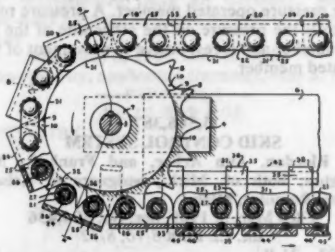
**3,586,393**

**CONVEYOR STRUCTURE**

**William G. Myers, 162 Monee Road, Park Forest, Ill.**

**Filed Jan. 23, 1969, Ser. No. 793,397**
**Int. Cl. B62d** *55/22*
**U.S. Cl. 305—35 R** **7 Claims**



The invention involves providing cooperative areas on a sprocket and a chain for stabilizing and improving the operation of the latter.

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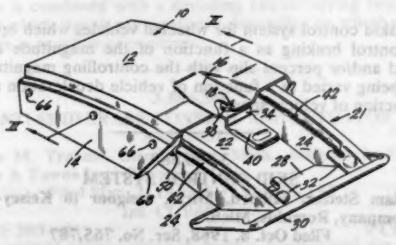
**3,586,394**

**FLEXIBLE PLASTIC DRAWER-TYPE RECEPTACLE GUIDE**

**Charles W. Hecksel, Spring Lake, Mich., assignor to Kent Products, Inc., Grand Haven, Mich.**

**Filed Aug. 14, 1969, Ser. No. 849,981**
**Int. Cl. F16c** *29/00*
**U.S. Cl. 308—3.6** **16 Claims**



A glide arrangement for supporting drawer-type receptacles and the like wherein the drawer being supported is inter-

posed between supporting members and the guide elements. The glide arrangement includes a longitudinal protuberance extending in the direction of relative movement between the drawer and its supporting member which cooperates with a generally U or channel-shaped guide element having a base region and spaced, parallel leg extension portions extending therefrom engaging the protuberance adjacent its base surface regions. The leg extensions are firmly flexible, having end regions arcuately disposed and depending away from each other and so engage the protuberance base regions as to firmly support the drawer against displacement transverse to the longitudinal length of the protuberances and guide elements under normal conditions, yet permitting such transverse displacement under predetermined conditions.

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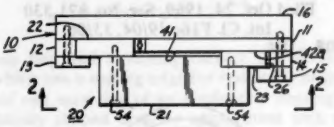
**3,586,395**

## BUILT-UP MACHINE TOOL SLIDE

**Paul J. Weaver, San Marino, Calif., assignor to Automatic Control Systems, Inc., El Monte, Calif.**

**Filed Apr. 1, 1969, Ser. No. 811,953**
**Int. Cl. F16c** *17/00; B23b 17/00*
**U.S. Cl. 308—3** **2 Claims**



A built-up machine tool slide assembly having a bed and a carriage. The carriage slides on rails mounted to the bed. The bearing surfaces are formed on separate parts which are assembled to form the structure. Adhesives may be used to join the parts.

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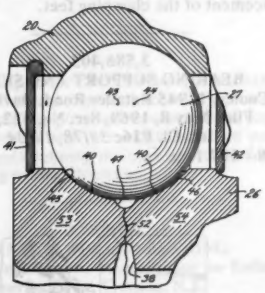
**3,586,396**

## ANTIFRICTION CARRIAGE ROLLER

**Victor L. Barr, Jenkintown, and Siegfried Beimfohr, Morrisville, both of, Pa., assignors to Roller Bearing Company of America, West Trenton, N.J.**

**Filed July 25, 1969, Ser. No. 844,798**
**Int. Cl. F16c** *29/06*
**U.S. Cl. 308—6R** **2 Claims**



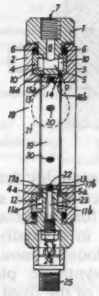
A carriage or mast roller for use on a fork lift truck or the like which is assembled by fracturing an inner race along its length, and after insertion of antifriction rolling elements, such as balls or rollers in cooperation with the outer race, joining together the fracture components in axially abutting interlocking relation. In the case of a ball bearing, the inner race can be machined so that the cross section forms parts of two different circles, and so that the balls engage the inner race on two axially spaced circumferential contacts. On either ball or roller bearings, can provide a lubrication opening or openings at the midlength of the inner race.

**3,586,397**

## FLUID BEARINGS

**Colin W. Dee, Wimborne, England, assignor to Aerostatic Limited, Dorset, England**

**Filed Nov. 5, 1969, Ser. No. 874,346**
**Claims priority, application Great Britain, Nov. 22, 1968, 55456/68**
**Int. Cl. F16c** *17/16*
**U.S. Cl. 308—9** **10 Claims**



A fluid bearing device comprises a stator having a cylindrical bore and an annular rotor which is disposed in an axially intermediate position along said bore, the stator and the rotor together defining a flow path for fluid through the device, the rotor being supported in the stator by fluid journal bearing means which are disposed wholly radially outwardly of the flow path through the device, the journal bearing means consisting of two distinct fluid bearings which are spaced axially of the rotor.

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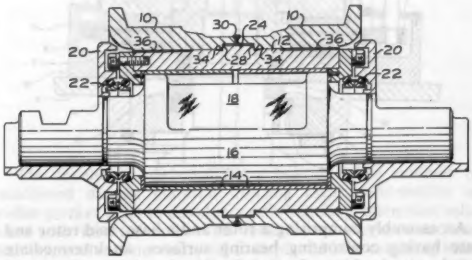
**3,586,398**

## TRACK ROLLER FOR TRACK-TYPE TRACTOR

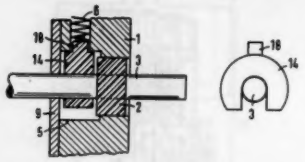
**Floyd S. Dadds, Peoria, and David V. Nelson, East Peoria, both of, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**

**Filed July 25, 1969, Ser. No. 844,843**
**Int. Cl. F16c** *13/00*
**U.S. Cl. 308—18** **4 Claims**



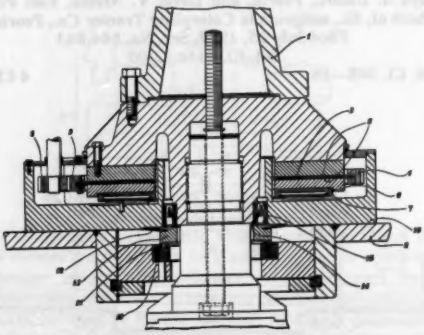
A track roller assembly including a roller hub supporting externally fitted rims and internally fitted bearing sleeves which rotate on a dead shaft. An unusually loose fit is provided between the rims and hub so that the hub is not compressed in assembly and then allowed to expand and cause deterioration of the bearings when the hub becomes enlarged from use. A tight fit between the rims and hub is provided inwardly of the rims in a narrow area which is limited by spaced shoulders which locate the rims and the hub. The shoulders are spaced to limit the areas of tight fit and also to locate them in safe areas where they will not be damaged in disassembly of the roller.

3,586,399
**OIL-FREE BEARING ASSEMBLY WITH DEVICE FOR SUPPRESSION OF BEARING NOISE**
Martin Muller, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany
Filed Mar. 26, 1969, Ser. No. 810,653
Int. Cl. F16c 27/00; H02k 5/16
U.S. Cl. 308—26 8 Claims



An oil-free bearing assembly for the journaling of shafts, particularly those of canned or sealed electric motors, is equipped with means for suppressing noise in the bearing. The shaft is journaled in a fixedly held bearing bushing of synthetic plastic. A loosely mounted second bushing or similar structure of synthetic plastic engages the shaft, preferably in proximity of the fixed bushing, and is subject to the force of adjustable means for imposing upon the shaft a radial bearing pressure that minimizes the noise in the bearing.

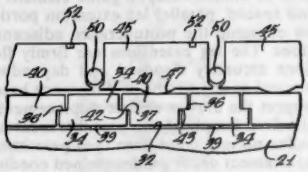
3,586,400
**BEARING ASSEMBLY OF THE SPIRAL GROOVE TYPE**
Knut Einar Wallin, Goteborg, and Erik Magnus Kellstrom, Partille, both of, Sweden, assignors to Aktiebalaget Svenska Kullagerfabriken, Goteborg, Sweden
Filed Mar. 17, 1969, Ser. No. 807,704
Claims priority, application Sweden, Mar. 20, 1968, 3648
Int. Cl. F16c 17/06
U.S. Cl. 308—160 4 Claims



An assembly comprising a rotor and a base, said rotor and base having confronting bearing surfaces, an intermediate member in the form of a thin flexible disc disposed between said confronting bearing surfaces and separate drive means for rotating said intermediate member, the opposite faces of said intermediate member having spiral grooves.

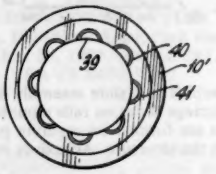
3,586,401
**BEARING ASSEMBLY**
Homer E. Gravelle, Denver, Colo., assignor to Sundstrand Corporation
Filed July 2, 1969, Ser. No. 838,497
Int. Cl. F16c 17/06
U.S. Cl. 308—160 9 Claims

A full film pivoted bearing pad, radial and thrust bearing assembly in which both the radial bearing pads and the thrust bearing pads are individually provided with lubricant supplied to grooves therein and in which the thrust bearing pads



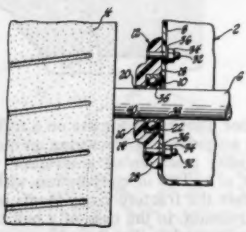
may be selectively removed to tailor the bearing capacity for a specific application and to provide the lowest practical power consumption.

3,586,402
**SELF-LOCKING BEARING RING**
Ralph S. Howe, Jr., New Britain, Conn., assignor to Textron, Inc., Providence, R.I.
Filed Oct. 24, 1969, Ser. No. 871,330
Int. Cl. F16c 19/04, 35/06
U.S. Cl. 308—184 3 Claims



The invention contemplates fabrication of a resilient self-locking structure in the bore of a ring to be mounted on a shaft. The structure involves an annulus of elastomeric material bonded to the bore and having a bore of diameter to encounter interference with a given shaft diameter, on which the resiliently lined ring is to be mounted. Plural angularly spaced metal feet are embedded in the elastomeric material, the feet being in radial clearance relation with the bearing ring bore and having inner surfaces exposed at the bore of the elastomeric material. Thus, the interference encountered upon shaft insertion develops resiliently loaded radially outward displacement of the clamping feet.

3,586,403
**BEARING SUPPORT AND SEAL**
Merritt S. Cooley, 12945 Ratallee Road, Davisburg, Mich.
Filed May 8, 1969, Ser. No. 822,885
Int. Cl. F16c 33/78, 19/04
U.S. Cl. 308—187.1 4 Claims



A bearing support and sealing member comprising a body of resilient plastic material with an opening formed therein for receiving an axle shaft, and a bearing supporting recess formed in the body coaxial with the axle receiving opening

such that an axle and bearing assembly mounted in the member are sealed from moisture and are resiliently supported on the body of a vehicle.

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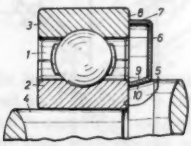
**3,586,404**

## SEALING RING ARRANGEMENT FOR ANTI-FRICTION BEARING

**Gunter Zahn, Dusseldorf, Germany, assignor to Ziller & Co., Dusseldorf, Germany**

**Filed Dec. 6, 1968, Ser. No. 781,814**
**Claims priority, application Germany, Dec. 14, 1967, P 16 25 661.4**
**Int. Cl. F16c** *33/78*
**U.S. Cl. 308—187.2** **7 Claims**



A sealing ring and mounting thereof for an antifriction bearing, which has a sealing edge for resiliently engaging one end face of one race ring of an antifriction bearing and also has a conically shaped arm for engagement with a conical surface on either the other race ring of the antifriction bearing or a conical surface of a housing or a shaft.

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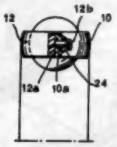
**3,586,405**

## CAGES FOR BEARING ROLLING ELEMENTS

**Georg Claesson, Turin, Italy, assignor to RIV-SKF Officine Di Villar Perosa S.p.A., Turin, Italy**

**Filed Apr. 2, 1969, Ser. No. 812,746**
**Claims priority, application Italy, Apr. 23, 1968, 51403A/68**
**Int. Cl. F16c** *33/38*
**U.S. Cl. 308—201** **4 Claims**



A cage for rolling elements of a bearing, for example a ball bearing, is molded in two identical halves which are interconnected by cooperating pins and sockets. Each cage half is provided with one pin and one socket between each pair of consecutive recesses defining the cage apertures for receiving respective bearing rolling elements.

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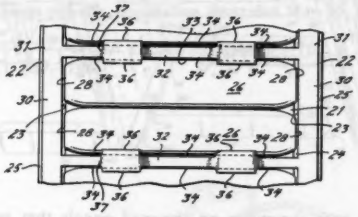
**3,586,406**

## TANDEM ROLLER BEARING

**Victor L. Barr, Jenkintown, Pa., assignor to Roller Bearing Company of America, West Trenton, N.J.**

**Filed July 14, 1969, Ser. No. 841,277**
**Int. Cl. F16c** *33/46*
**U.S. Cl. 308—217** **9 Claims**

A tandem cage-type cylindrical needle roller bearing having a race ring which is provided with a raceway and integral flanges at both ends of the raceway, the flanges having circumferential surfaces around the axis, needle rollers in contact with the raceway between the flanges, the rollers being arranged in tandem groups side by side, preferably two in each group, in which the rollers of each tandem group are mutually in contact, and a jointless tubular cage extends circumferentially around the bearing, the cage having rims which ride the circumferential surfaces of the flanges, the cage having windows or pockets in which the tandem groups of rollers are retained in the race, the windows being spaced circumferentially by cage crossbars, the crossbars at the axial ends being connected to the cage rim adjoining the circumferential surfaces of the flanges, the crossbars having guiding surfaces substantially in the pitch circle and located near the ends of the rollers (within 25 percent of the roller length of the ends) for engaging circumferential sides of the rollers, preferably in abutting relation, and also retaining surfaces located on the side of the pitch circle remote from the raceway and close enough together to restrain the tandem group of rollers from leaving the window or pocket, the retaining surfaces preferably converging in the general radial direction away from the adjoining raceway.



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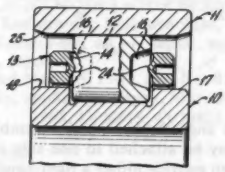
**3,586,407**

## ROLLER BEARING RETAINING MEANS

**Michael Schweitzer, Southington, Conn., assignor to Textron Inc., Providence, R.I.**

**Filed May 5, 1969, Ser. No. 821,569**
**Int. Cl. F16c** *33/46*
**U.S. Cl. 308—217** **2 Claims**



The invention contemplates a bearing-roller retainer of machined ductile material utilizing local deformation of roller-pocket sides to develop a unit-handling assembled relation with inserted rolls. The rolls are of the recessed-end variety, and retainer material is displaced into retaining relation with the recessed ends of the rollers. The nature of the displacement is such as to achieve a retained assembly of rollers while avoiding any upset to the inherent running balance and dimensional accuracy of the machined retainer structure.

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**3,586,408**

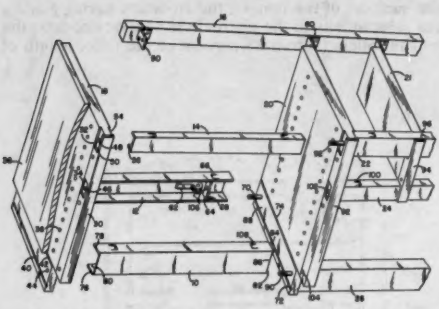
## CABINET ASSEMBLY FOR AN EXPANSIBLE CABINET

**Robert T. Dickson, El Cajon, Calif., assignor to Dickson-Smith, Inc., El Cajon, Calif.**

**Filed July 10, 1969, Ser. No. 840,756**
**Int. Cl. A47b** *77/00, 87/00*
**U.S. Cl. 312—107** **10 Claims**

An expansible cabinet assembly in which aligned ends of U-shaped laterally positioned rails are secured to opposite

sides of a wall panel by a stud connection with a quick acting lever and cam arrangement that draws the ends of the rails in



abutment with structures on the wall panels that restrain lateral or rotational movement of the assembled rails on the wall panel.

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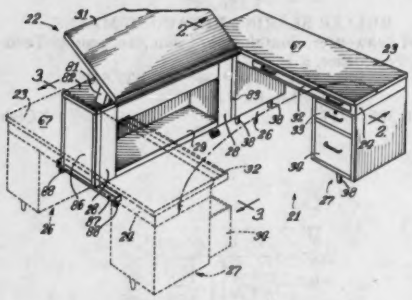
**3,586,409**
**REFERENCE DESK CONSTRUCTION**
**Earl J. Cisler, Two Rivers, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.**
**Filed May 21, 1969, Ser. No. 826,564**
**Int. Cl. F16b *12/00*; A47b *17/00***
**U.S. Cl. 312—111** **13 Claims**



A drafting table and reference desk assembly wherein the reference desk may be attached to one side or the other of the drafting table to provide either a right-hand or a left-hand arrangement. The reference desk comprises a desk top, a frame and lower supports. With the frame in one position, the desk top and lower supports respectively may be secured to the top and bottom surfaces of the frame suitable for a right-hand arrangement. When the frame is inverted 180°, the desk top and lower supports may be secured to the opposite surfaces of the frame suitable for a left-hand arrangement. The desk top is removably fastened to the frame by retainers which simplify the assembly and disassembly of the parts. The lower supports are removably secured to the frame by ordinary fastening means.

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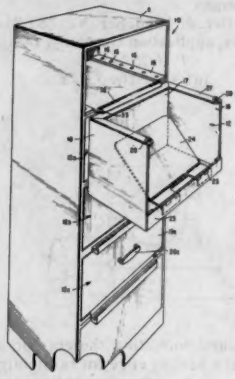
**3,586,410**
**FILE CABINET II**
**James E. Barrow, 148 Main St., Jonesboro, Ga.**
**Filed Oct. 24, 1969, Ser. No. 869,172**
**Int. Cl. A47b *88/00***
**U.S. Cl. 312—323** **12 Claims**

A filing cabinet having a series of vertically arranged drawers which are designed for horizontal storage of documents and drawings. When withdrawn from the filing cabinet, these drawers are pivoted downward about a stationary lip secured laterally to the cabinet front between the bottom of the drawer being withdrawn and the top of the drawer immediately below. In this manner, the fully withdrawn drawer is suspended in a vertical position from the



lip by an elongated, curved flange extending laterally of the bottom rear edge of the drawer and hooked about the lip so as to place the stored documents and drawings, which previously were in a horizontal position, in a vertical position for ready access thereto.

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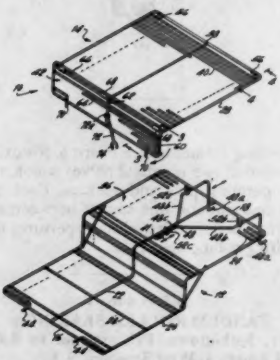
**3,586,411**
**DISPLAY RACK**
**William T. Brigham, 230 Park Ave., New York, N.Y.**
**Filed Apr. 18, 1969, Ser. No. 817,527**
**Int. Cl. A47b *88/00*, *95/00***
**U.S. Cl. 312—351** **4 Claims**



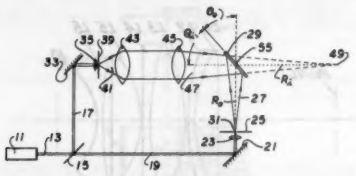
An adjustable display rack for use in conjunction with a display case is constructed with a base member having a forward tray section and a rearward tray section, the rearward tray section being disposed at a level above that of the forward tray section, the base member being inserted in the display case and spanning the case from front to back. A variable extension member is engageable with the rearward tray section to form an elevated display shelf above the forward section of the base member, the length of the extension being adjustable to accommodate changing requirements.

3,586,412

## HOLOGRAPHIC LENS WITH ABERRATION CORRECTION

Emmett N. Leith, Plymouth, Mich., assignor to The Battelle Development Corporation, Columbus, Ohio

Filed May 20, 1968, Ser. No. 730,447
Int. Cl. G02b 27/22
U.S. Cl. 350—3.5 8 Claims



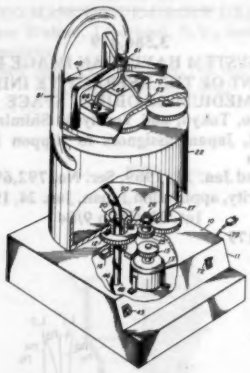
A technique for holographically constructing a lens made of stacked Fresnel zone plates on a thick emulsion photographic film which is capable of imaging a wide object field by joining the individual fields of each superimposed Fresnel zone plate to form an unaberrated composite image. The extent of the individual zone plate field is determined by the emulsion thickness and optical construction geometry and thereby allows restriction of this field to a size capable of unaberrated imaging.

3,586,413

## APPARATUS FOR PROVIDING ENERGY COMMUNICATION BETWEEN A MOVING AND A STATIONARY TERMINAL

Dale A. Adams, 7434 E. Montecito Drive, Tucson, Ariz.

Filed Mar. 25, 1969, Ser. No. 810,310
Int. Cl. G02b 17/00; H01r 39/00
U.S. Cl. 350—7 3 Claims



A rotating platform is supported above a stationary surface by means of a rotating support. The platform and support are driven about their respective axes in the same relative direction at speeds in the ration of two-to-one respectively. A terminal is located on the stationary surface is communication with a second terminal positioned on the rotating platform. An energy-guiding channel such as an electrical conductor is connected between the first and second terminals and is positioned to extend closer to the axis of said rotating support than the rotating support and subsequently up to the rotating platform, around the platform, onto the surface to which the second terminal is connected. The surface of the rotating platform upon which the second terminal is located is positioned remote or away from the stationary surface so that the electrical conductor is forced to follow a path around the outer edge of the platform down to the stationary surface.

## ERRATUM

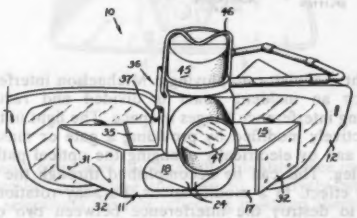
For Class 350—007 see:
Patent No. 3,586,435

3,586,414

## BINOCULAR VIEWING DEVICE

Donald Herbert Schultz, Black Forest South Australia, Australia, assignor to Sola International Pty. Ltd., Black Forest, Australia

Filed May 13, 1969, Ser. No. 824,160
Claims priority, application Australia, May 16, 1968, 37952/68
Int. Cl. G02b 25/02; A61b 3/10
U.S. Cl. 350—146 7 Claims



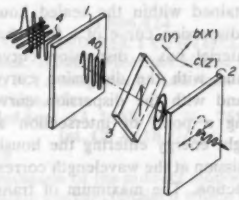
A binocular-viewing device suitable for use by opthalmologists containing binocular-viewing means with a double mirror reflector system and a lamp housing for illuminating an object, the lamp housing having a curved reflector and a lens system constituted by a single element having an aspherical face. So that the illuminating efficiency is high, the size and weight of the lamp and lamp housing is small and consequently the size and weight of the headpiece is small and can be carried on a spectacle frame.

3,586,415

## LIGHT MODULATOR ELEMENT

Akio Kumda, Kodaira-shi; Keiichiro Aizu, Tokyo, and Yoshio Furuhata, Kodaira-shi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1969, Ser. No. 810,161
Claims priority, application Japan, Mar. 30, 1968, Mar. 30, 1968, 43/20815; 43/20816
Int. Cl. G02f 1/26
U.S. Cl. 350—150 5 Claims



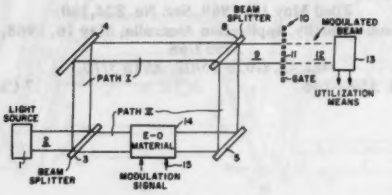
A device for modulating and a nondestructive readout storage device employing modulation of light transmitted through an irregular ferroelectric crystal before and after the rotation of the vibration plane thereof caused by an applied electric field equal to or larger than the coercive field thereof.

3,586,416

## LIGHT MODULATOR BY GATED INTERFEROMETRY

Dominick J. De Bitetto, Briarcliff Manor, N.Y., assignor to U. S. Philips Corporation, New York, N.Y.

Filed July 18, 1968, Ser. No. 745,911
Int. Cl. G02f 1/28, 1/26; G01b 9/02
U.S. Cl. 350—160 9 Claims




A light modulator employing a Michaelson interferometer in which an incident beam is divided and recombined producing interference fringes in space. The light output may be selectively modified by providing a gate or mask at the output, and by electrically changing the optical path length of one leg. This can be accomplished through the Kerr or Pockels effect. In a modifications, Faraday rotation is employed to destroy the interference between two coherent beams.

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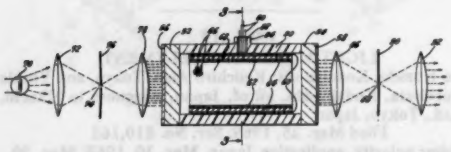
3,586,417

## VARIABLE COLOR FILTER

Louis G. Fields, Los Angeles, Calif., assignor to Calbiochem, Los Angeles, Calif.

Filed Aug. 21, 1968, Ser. No. 754,339
Int. Cl. G02f 1/28; G02g 5/24
U.S. Cl. 350—160 18 Claims



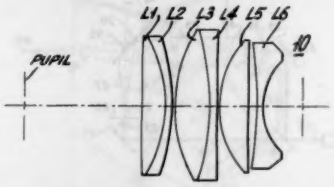
This invention is directed to a variable color filter, which color filter includes a sealed housing containing at least one window for the passage of light energy. A plurality of small particles formed of a first material such as quartz are mixed with a fluid medium formed of a second material, and the mixture is contained within the sealed housing. The first material has a dispersion curve of a first characteristic and the second material has a dispersion curve of a second characteristic and with the dispersion curve of a second characteristic and with the dispersion curves of the two materials having a point of intersection at a particular wavelength. Light energy entering the housing has a maximum of transmission at the wavelength corresponding to this point of intersection. The maximum of transmission at the particular wavelength results from the Christiansen filter effect. The present invention additionally includes an element located within the sealed housing so as to produce a change in the temperature of the mixture with a corresponding change in the pressure of the mixture and with these changes producing changes in the point of intersection of the two dispersion curves thereby changing the wavelength for the maximum transmission of the light energy.

3,586,418

## WIDE-ANGLE EYEPIECE LENS SYSTEM

Haruo Abe, Sakai, Osaka, Japan, assignor to Minolta Camera Co., Ltd., Osaka, Japan

Filed Mar. 17, 1969, Ser. No. 807,760
Claims priority, application Japan, Mar. 27, 1968, 43-19918
Int. Cl. G02b 9/12, 9/34, 25/00
U.S. Cl. 350—176 6 Claims




A highly corrected wide angle eyepiece lens system includes first, third and fifth positive and second, fourth and sixth negative lens elements the first two elements forming a cemented positive composite lens with a concave rear and convex front face and the third and fourth elements forming cemented positive lens with a convex rear face, the fifth element rear face and the sixth element front face being concentric with a point on the image side. The lens system possesses the following relationship:

$$|r_9| \leqq |r_{12}| + d_9 - 12 \leqq 1.5f$$
$$|r_5| \leqq |r_4| \leqq 2.5f$$

wherein $r_n$ is the radius of curvature of the subscript designated lens face; $d_{9\text{-}12}$ is the axial distance between the ninth and 12th lens faces and $f$ is the focal length of the lens system.

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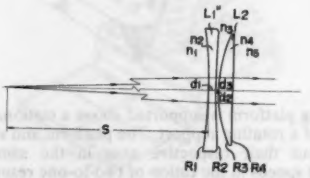
3,586,419

## OPTICAL SYSTEM HAVING AN IMAGE DISTANCE INDEPENDENT OF THE REFRACTIVE INDEX OF THE MEDIUM OF OBJECT SPACE

Zenji Wakimoto, Tokyo, and Yoshiyuki Shimizu, Kanagawa-ken, both of, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 21, 1969, Ser. No. 792,695
Claims priority, application Japan, Jan. 24, 1968, 43/3758
Int. Cl. G02b 9/04
U.S. Cl. 350—179 2 Claims



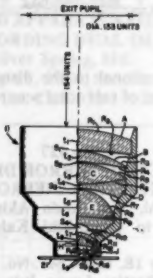

This invention relates to an optical system that has an image distance independent of the refractive index of the object medium, more particularly to an optical system wherein the first surface of the optical system in contact with the object space has a radius of curvature identical with the sphere having the center at the object point on the optical axis in the object space the object distance is kept within a specified range, and thus the image distance can always be kept at a certain specified value regardless of the refractive index of the medium of the object space.

3,586,420

## HIGH PERFORMANCE FIVE-GROUP OBJECTIVE LENS

Bruce Huntress Walker, Liverpool, N.Y., assignor to General Electric Company

Filed Sept. 29, 1969, Ser. No. 861,654
Int. Cl. G02b 9/60, 9/62
U.S. Cl. 350—176 2 Claims



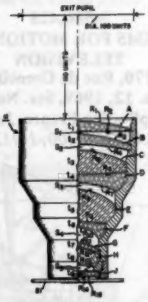
A high performance objective lens is disclosed having a relative aperture of *f*/0.75 and good low frequency optical performance. The lens consists of two menisci and three doublet groups to form a five-group lens wherein each group provides positive power. In one doublet group, a special short flint is provided for secondary achromatization. The lens is designed for use in a fluoroscopic examination system taking into account a range of glass thicknesses in the back focal region of the lens suiting it for use with a variety of image intensifiers. The exit pupil is located well in advance of the front element of the lens for efficient optical coupling to multiple optical output devices.

3,586,421

## HIGH PERFORMANCE FIVE-GROUP OBJECTIVE LENS

Bruce Huntress Walker, Liverpool, N.Y., assignor to General Electric Company

Filed Sept. 29, 1969, Ser. No. 861,655
Int. Cl. G02b 9/60, 9/62
U.S. Cl. 350—176 2 Claims



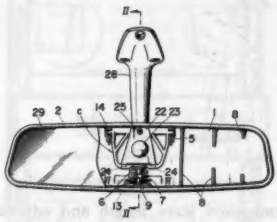
A high performance objective lens is disclosed having a relative aperture of *f*/1.0 and good low frequency optical performance. The lens consists of two menisci and three doublet groups to form a five-group lens wherein each group provides positive power. In one doublet group, a special short flint is provided for secondary achromatization. The lens is designed for use in a fluoroscopic examination system taking into account a range of glass thicknesses in the back focal region of the lens suiting it for use with a variety of image intensifiers. The exit pupil is located well in advance of the front element of the lens for efficient optical coupling to multiple optical output device.

3,586,422

## ADJUSTABLE REAR VIEW MIRROR

Kenichi Kagami, Tokyo; Makoto Yamashita, Kanagawa, and Masagoro Kushida, Yokohama-shi, all of, Japan, assignors to Ichiko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1969, Ser. No. 798,290
Claims priority, application Japan, Oct. 18, 1968, 43/90496
Int. Cl. G02b 5/08, 7/18
U.S. Cl. 350—281 6 Claims



An easily fabricated, substantially vibration-free inside mirror assembly permitting the user to positively and easily change selectively the two reflecting positions thereof is obtained by the arrangement: a mirror having two intersecting front and rear reflection surfaces with low and high reflection factors, respectively, and being secured to the open front side of a mirror casing molded with a synthetic resin, and a mirror angle regulating polygonal plate fixed around a mirror angle shifting rod and extending through the bottom wall of said casing and engagingly inserted, at its top, in the bottom slot of an attachment fitting pivotably supported in the mirror casing, said plate being resiliently nipped by a pair of stoppers formed in the mirror casing integrally therewith.

3,586,423

## METHOD OF IMPROVING COLOR DISCRIMINATION

Harry I Zeltzer, 9 Rumford, Lexington, Mass.

Continuation-in-part of application Ser. No. 857,543, Sept. 12, 1969, now abandoned, which is a continuation-in-part of application Ser. No. 462,068, June 7, 1965, now abandoned. This application June 24, 1970, Ser. No. 49,582
Int. Cl. G02c 7/10, 7/04; G02b 1/04
U.S. Cl. 351—39 3 Claims

A method and device are described for improving color discrimination in persons having a substantial amount of deficiency in their ability to discriminate between red and green colors, commonly referred to as "color blindness." The invention comprises applying to one eye only a corneal contact lens transmitting light substantially only in the red zone and leaving the other eye either naked or with its customary refractive correction, if any.

3,586,424

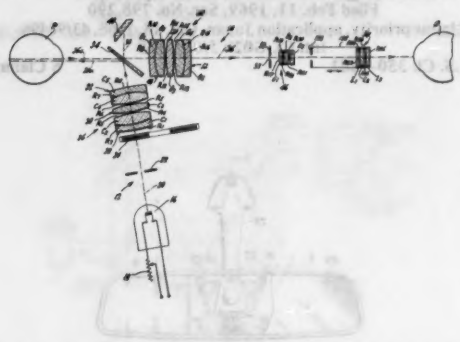
## MONOCULAR INDIRECT OPHTHALMOSCOPE

George F. Schenk, Williamsville, and Milton H. Sussman, Buffalo, both of, N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed Sept. 13, 1968, Ser. No. 759,651
Int. Cl. A61b 3/12
U.S. Cl. 351—9 2 Claims

An ophthalmoscope of the indirect monocular type including an illumination system contained within the handle of the instrument, a viewing system contained within the viewing section of the instrument and a beam splitter contained within the bridge of the instrument, the bridge interconnecting the handle and the viewing section. The beam splitter reflects illumination to the patient's retina and transmits the rays from the illuminated retina to the practitioner. The viewing system has a magnification less than unity with an adjustable focus to correct for refractive errors of the eyes of both patient and practitioner. The viewing system erects the

inverted, reversed image of the patient's retina. The several controls on the instrument determining the field of illumination, the illumination wave length and adjusting focus are grouped for convenient one-handed manipulation by the practitioner.



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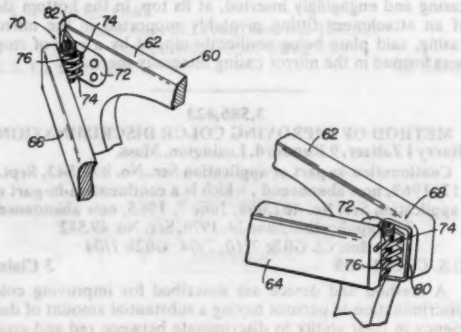
**3,586,425**

**SPECTACLES HAVING SPRING-BIASED HINGES**

**Donald L. Gilman, 1115 Vine St., Cincinnati, Ohio**

**Filed June 11, 1969, Ser. No. 832,315**
**Int. Cl. G02c** *5/16, 5/20*
**U.S. Cl. 351—113** **2 Claims**



Spectacle hinges are provided with spring devices biasing the temples toward one another so that, when released, the temples fold against the spectacle frame. Each spring device includes a helically coiled portion coaxial with the hinge barrel and projecting slightly above the hinge barrel. In one embodiment, the hinge pin is longer than the hinge barrel for receiving the spring device. In a preferred embodiment the spring device has a wire length that replaces the usual hinge pin.

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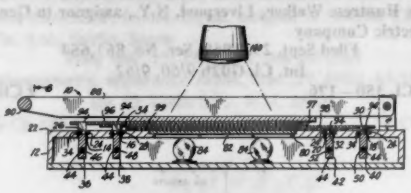
**3,586,426**

**METHOD AND APPARATUS FOR ANIMATION**

**Rene Bras, New York, N.Y., assignor to Depthimation Inc., New York, N.Y.**

**Filed Nov. 12, 1968, Ser. No. 775,023**
**Int. Cl. G03b** *41/00*
**U.S. Cl. 352—52** **11 Claims**

A method and apparatus for animation wherein a total scene is divided into a plurality of substantially two-dimensional portions according to the distance of said portions from the viewing point of said total scene. The portions are disposed in adjacent relation and successively photographed. Each of the portions are displaced between successive photograph takings in an edgewise direction a distance substantially inversely proportional to the distance of said portion from the viewing point of said total scene.



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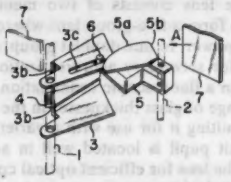
**3,586,427**

**MOVABLE REFLECTING MIRROR DRIVE DEVICE FOR CARTRIDGE-TYPE CINEPROJECTORS**

**Tokusaburo Kakiuchi, and Ando Akira, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Ota-ku, Tokyo, Japan**

**Filed July 18, 1969, Ser. No. 842,911**
**Claims priority, application Japan, July 18, 1968, 43/50779**
**Int. Cl. G03b** *23/02*
**U.S. Cl. 352—72** **3 Claims**



A movable reflecting mirror drive device for cartridge-type cineprojectors wherein a movable reflecting mirror frame which is moved into and away from a path of insertion of a cartridge is drivingly interconnected to a blade-shaped rod. Upon insertion of the cartridge, its projection drives the rod so as to retract it together with the frame from the path. Upon removal of the cartridge, the projection rotates the frame and then the rod after disengagement from the frame so as to retract the frame from the path.

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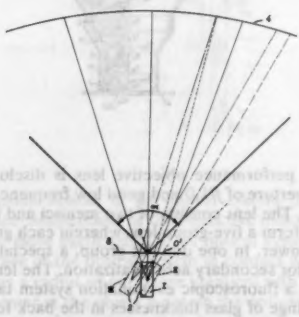
**3,586,428**

**FILMING SYSTEMS FOR MOTION PICTURES AND TELEVISION**

**Claude A. Matalou, 170, Rue de Grenelle, Paris, France**

**Filed Feb. 12, 1969, Ser. No. 798,599**
**Claims priority, application France, July 4, 1968, 157,921**
**Int. Cl. G03b** *15/00, 15/12, 21/28*
**U.S. Cl. 352—89** **4 Claims**



Method of and apparatus for making motion-picture and television films with simultaneous projection of a background

on a screen, by using an intermediate reflection on a semisilvered mirror, which consists in providing means for producing a rectilinear or circular lateral movement of the camera in combination with the pivotal movement of the camera in a horizontal plane in order to preserve the coincidence of the projections of said camera and of the projector on said semisilvered mirror.

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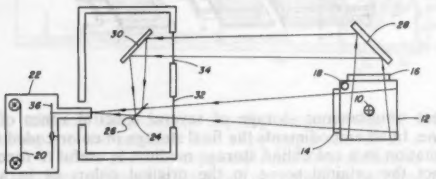
3,586,429

## METHOD AND APPARATUS FOR OPTICALLY RECORDING DUAL IMAGES

Paul H. Cords, Jr., Silver Spring, Md.

Filed July 19, 1968, Ser. No. 746,230
Int. Cl. G03b *19/18*
U.S. Cl. 352—93 9 Claims



A method and apparatus for optically recording dual images of the same body wherein a first image is reflected directly into a camera through a light discriminating filter, and a second image of the body is reflected into the camera through an optical path defined by an arrangement of reflective surfaces having a second light discriminating filter in the path such that the two images may be discriminated after recording.

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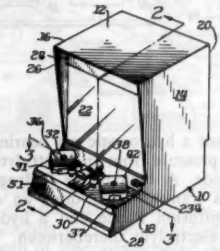
3,586,430

## FILM TRANSPORT APPARATUS

Chester S. Rempala, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Mar. 12, 1968, Ser. No. 712,419
Int. Cl. G03b *23/12*
U.S. Cl. 353—26 18 Claims



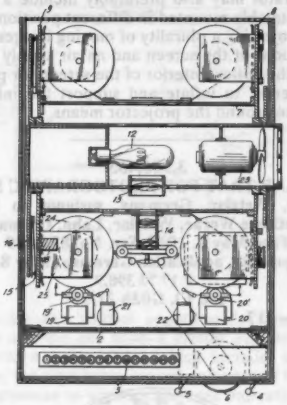
Film transport apparatus for moving microfilm in either of two directions with equal facility, past a projection aperture. The transport apparatus has identical components on each side of the optical centerline, and maintains continuous tension on the film web during its movement. The film supply spool may be located on either a left or right spindle shaft in order to accommodate microfilm for a correct display orientation regardless of the film wrap direction.

3,586,431

## MICROFILM PROJECTOR WITH REEL SELECTION MECHANISM

Gordon Fraser, 353 W. 57th St., New York, N.Y.

Filed Apr. 24, 1968, Ser. No. 723,656
Claims priority, application Italy, Dec. 1, 1967, 795592
Int. Cl. G03b *23/12*
U.S. Cl. 353—26 1 Claim



This invention relates to a multiple reel microfilm projector having mechanism for reel selection by "pushbutton" operation, and providing for shifting from one reel to another without the necessity of rewinding reels prior to such reel change, and making possible the storage of a large number of microfilm images in a relatively small space, instantly available without changing reels one at a time as usually is done in present microfilm projectors.

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3,586,432

## SELF-CONTAINED IMAGE PROJECTING APPARATUS AND REAR PROJECTION SCREEN THEREFOR

Jack M. Pentes, Jr., Charlotte, N.C., assignor to Pentes Design Incorporated, Charlotte, N.C.

Filed Apr. 1, 1969, Ser. No. 812,232
Int. Cl. G03b *21/22*
U.S. Cl. 353—74 1 Claim

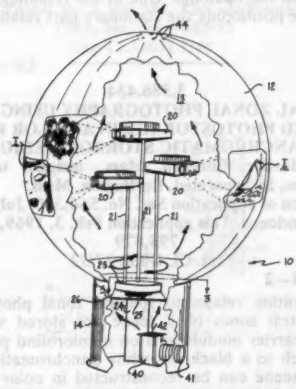

Image projecting apparatus comprising a translucent rear projection screen for receiving projected images on the rear side thereof and for presenting the images for observation on the front side thereof. The screen is three-dimensional,

preferably generally spherical in shape for providing a smoothly curved outside observation surface of at least 270°, and defines at least a substantially enclosed hollow interior for containing entirely therewithin a complete image projector means so that images from the projector means may be projected through the screen to any desired portion of the outside circumference of the screen. The screen is preferably flexible and inflatable for being internally air supported in its three-dimensional configuration to provide ease in assembly and disassembly around the projector means. The image projecting apparatus may also preferably include a plurality of projectors rotatably mounted in different positions within the screen for projecting a plurality of moving images onto a plurality of portions of the screen and an air supply means connected with the hollow interior of the screen for providing air internally thereof to inflate and support the inflatable and flexible screen around the projector means.

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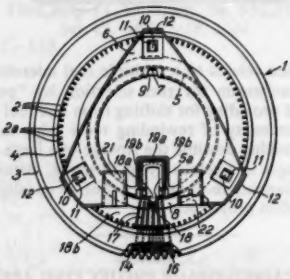
**3,586,433**

## CIRCULAR TRAY FOR PHOTOGRAPHIC SLIDES

**Hans Mulch, Wetzlar, Germany, assignor to Ernst Leitz GmbH, Optische Werke, Wetzlar, Lahn, Germany**

**Filed May 2, 1969, Ser. No. 821,449**
**Claims priority, application Germany, May 8, 1968, P 17 72 390.9**
**Int. Cl. G03b *21/00***
**U.S. Cl. 353—117** **8 Claims**



A two part tray is disclosed in which an outer part is established by peripheral rings and the slide compartment defining partitions extend therefrom radially inwardly. The inner part is to remain stationary, axial retaining flanges and hub serving as stop for the slides. The retaining flanges and hub have openings through which a slide gripper of a projector can reach for removing the slide in the compartment registering with the openings. One of the retaining flanges has fasteners for positioning the stationary part relative to a projector.

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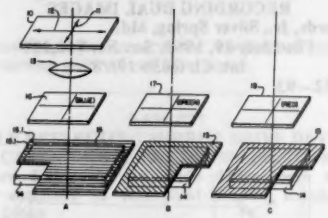
**3,586,434**

## SPECTRAL ZONAL PHOTOGRAPHY USING COLOR-CODED PHOTOSTORAGE IN A COLOR BLIND PANCHROMATIC STORAGE MEDIUM

**Peter F. Mueller, Concord, Mass., assignor to Technical Operations, Incorporated, Burlington, Mass.**

**Continuation of application Ser. No. 564,340, July 11, 1966, now abandoned. This application Feb. 3, 1969, Ser. No. 795,879**
**Int. Cl. G03b *27/32***
**U.S. Cl. 355—2** **32 Claims**

This invention relates to spectral zonal photography in which spectral zones of a scene are stored with unique respective carrier modulations on a colorblind photostorage medium such as a black-and-white panchromatic film from which the scene can be reconstructed in color by Fourier transform techniques with spatial and spectral filtering, and in particular to methods and means to effect such storage without the intervention of a plurality of separate individual images of the scene. Each of several spectral zones is modulated with a periodic function, such as a grating having a unique orientation relative to the scene. Embodiments are disclosed in which these zones and their respective modulations can be stored in sequence or simultaneously. Unique spectral zonal filters are disclosed for simultaneous storage of several spectral zones of a scene. In one aspect of the invention such filters can be employed in direct contact with the storage medium. In another embodiment, Fourier transform techniques are employed with spatial and spectral filtering to



effect simultaneous storage of several spectral zones of a scene. In all embodiments the final storage of color-coded information in a colorblind storage medium is useful to reconstruct the original scene in the original colors or in any desired portion or portions of the visible spectrum by means of Fourier transform and filtering techniques. The reconstructed scene can be viewed in full color or recorded on a color sensitive medium.

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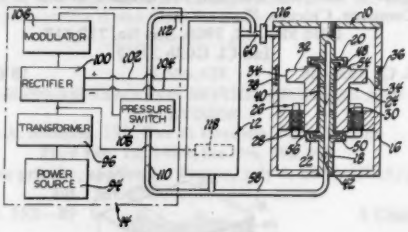
**3,586,435**

## ELECTROLYTIC PUMP OPERATED GAS BEARING

**Carlo Del Carlo, Utica, and Keith R. Jenkin, Warren, both of, Mich., assignors to Speedring Corporation, Warren, Mich.**

**Filed Dec. 4, 1969, Ser. No. 882,174**
**Int. Cl. G02b *17/00*; F16c *17/16*; C01b *13/04***
**U.S. Cl. 350—7** **25 Claims**



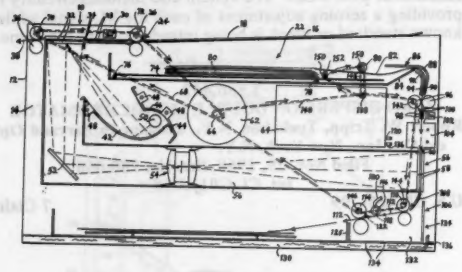

There is disclosed a hydrostatic gas bearing supplied with hydrogen at high pressure from an electrolytic cell operated in a pumping mode. A high purity hydrogen gas at high steady pressure is transmitted through an electrolytic cell using hydrogen diffusion anode and a hydrogen diffusion cathode and an electrolyte therebetween. With a voltage across the electrodes and with the anode and cathode chambers charged with hydrogen and a flow restrictor in the external fluid path between the chambers, hydrogen is transmitted through the anode, electrolyte and cathode to develop superatmospheric pressure in the cathode chamber and subatmospheric pressure in the anode chamber. The hydrostatic gas bearing with its associated load device is suitably operated in a closed container with the high pressure hydrogen applied to its inlet passage and the container being partially evacuated by connection to the low pressure chamber of the electrolytic cell thereby reducing the windage loss in operation of the load device.

3,586,436

## TABLETOP ELECTROSTATIC COPYING MACHINE

William B. Jarzembski, Riverside; Joseph H. Jaeger, Evanston, both of, Ill., and Sperry Rand Corporation, New York, N.Y.

Filed Mar. 4, 1968, Ser. No. 710,266
Int. Cl. G03g 15/10
U.S. Cl. 355—10 6 Claims



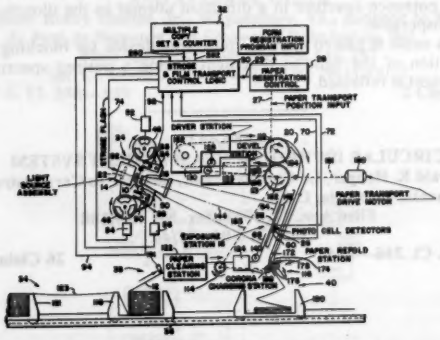
A tabletop electrostatic copying machine has a tunnel opening for the original. The copy paper moves in a path with few bends past the exposure station synchronized with the moving original. Liquid toner is applied to only one face of the copy to minimize drying time. The bottom of the housing is a reservoir for the toner and excess toner from the copy paper falls there.

3,586,437

## HIGH-SPEED PRINTER

Charles H. Dietz, San Diego; Roger A. Frech, Spring Valley; Max K. Muir, San Diego, and Merlin L. Puck, San Diego, all of, Calif., assignors to Stromberg Datagraphix, Inc., San Diego, Calif.

Filed Oct. 28, 1968, Ser. No. 771,077
Int. Cl. G03b 15/00
U.S. Cl. 355—14 21 Claims



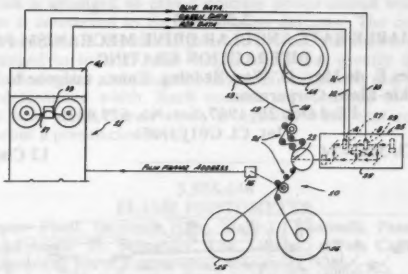
A high-speed printer makes one or more enlarged copies of image frames of a photographic medium, such as a strip of unperforated microfilm, on a photosensitive hard copy medium, such as a web of zinc-oxide-coated paper, by an electrophotographic process. Typically, a film transport moves the microfilm intermittently while a paper transport moves the paper in a continuous manner, with a high-speed flashlamp flashing images from the microfilm onto the paper. If desired, predetermined portions of the paper may contain preprinted business forms and the images from the microfilm may be registered therewith. Also, a train of carts may be provided passing under the printer, each carrying a stock of fan-folded paper to permit head-to-tail splicing of the paper so that printing may continue without interruptions for paper loading.

3,586,438

## AUTOMATIC CURING AND CONTROL SYSTEM FOR OPTICAL PRINTERS AND THE LIKE

Robert P. Gyori, Thousand Oaks, Calif., assignor to Metro-Goldwyn-Mayer, Inc., Culver City, Calif.

Filed Apr. 12, 1968, Ser. No. 720,926
Int. Cl. G03b 27/10
U.S. Cl. 355—103 24 Claims



Programming and control apparatus for printing motion picture film and the like from a master negative film in accordance with a control tape which includes coded digital control data, the tape being moved and control being accomplished in response to appropriate cues indicating where the desired controls are to be effected in the printing process. Remote film frame cuing is achieved by counting frame numbers of the master negative film from a zero reference to thereby assign a unique address to each film frame, adding to the control tape data the addresses of the particular frame at which various controls are to be carried out, and sequentially comparing each master frame address with the next control tape address to command release of control data only upon address coincidence. Additional logic is also provided to enable the control tape to effectively achieve printer control in both the reverse and forward directions of movement of the master negative film.

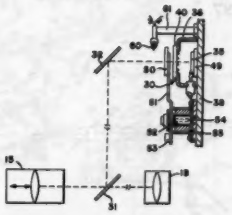
A novel control tape printer and reader is also provided for writing and verifying control tape cues and control data.

3,586,439

## DIRECT READING PYROMETER EMPLOYING PYROELECTRIC CRYSTAL DETECTOR

Richard W. Treharne, Xenia, and Charlton K. McKibben, Dayton, both of, Ohio, assignors to Kettering Scientific Research, Inc.

Continuation-in-part of application Ser. No. 604,976, Dec. 27, 1966, now Patent No. 3,398,281. This application July 15, 1968, Ser. No. 744,992
Int. Cl. G01j 5/48
U.S. Cl. 356—43 8 Claims



A lead zirconium titanate crystal possessing pyroelectric characteristics is employed in a direct reading pyrometer for measuring directly the temperature of an object, principally by the infrared radiation emitted therefrom. The pyroelectric crystal is provided on two opposing surfaces with an electrically conductive material and absorbing coating is placed on

the surface exposed to the incident radiation to convert that radiation into heat thereby polarizing the pyroelectric crystal and developing an electrical voltage related to the temperature of the object. A low inertia oscillating vane interrupts the incident radiation to provide a continuous voltage output from the crystal, and filtering and gating circuits are included in the electronic readout circuit to minimize piezoelectric voltages which may be generated by mechanical forces transmitted to the crystal.

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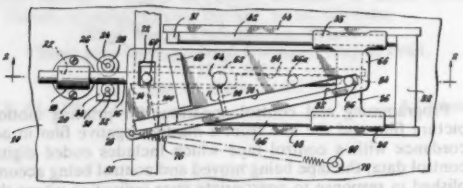
**3,586,440**

**VARIABLE RATE ANGULAR DRIVE MECHANISM FOR A DIFFRACTION GRATING**

**Charles F. de May, II, West Redding, Conn., assignor to The Perkin-Elmer Corporation**

**Filed Oct. 30, 1967, Ser. No. 679,011**
**Int. Cl. G01j** *3/06*
**U.S. Cl. 356—74** **12 Claims**



An optical dispersion element (e.g., a diffraction grating) is mounted on a scanning arm, pivoted on a first pivot pin carried by an auxiliary lever, which in turn is pivoted about a second fixed pivot pin. An (angled straight) edge of the scanning arm is cammed by a linearly moving driving pin so as to cause initially the scanning arm to pivot about the first, lever-carried pivot pin. A blocking mechanism inhibits rotative movement of the scanning arm relative to the auxiliary lever at a certain position, beyond which the scanning arm and the lever necessarily pivot conjointly about the second fixed pivot pin. The grating is therefore rotated at two different but related mathematical functions of the driving pin motion. A specific example obtains two different cosecant functions, thereby rotating a grating at two different angular rates (each of which is differently proportional to the wave number of the diffracted radiation leaving the grating in a fixed (in space) direction), thereby yielding a "scale change" during the grating rotative scanning.

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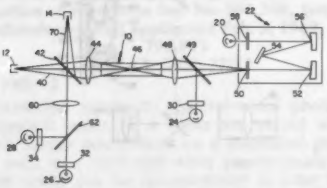
**3,586,441**

**ATOMIC ABSORPTION SPECTROANALYSIS SYSTEM**

**Stanley Babcock Smith, Lexington; Jerrold Zindler, Cambridge; Rauf Argon, Beford, and David E. Blackmer, Weston, all of, Mass., assignors to Instrumentation Laboratory, Inc., Watertown, Mass.**

**Filed July 12, 1967, Ser. No. 652,976**
**Int. Cl. G01j** *3/42*
**U.S. Cl. 356—97** **16 Claims**



An atomic absorption spectroanalysis system includes a burner for generating a flame, two radiation sources, and two pairs of radiation sensors. An optical system passes radiation from each source along a first path through the flame for sensing by a corresponding sensor to produce an I signal, and along a second path outside the flame for sensing by a corresponding second sensor to produce an $I_o$ signal. The radiation output of each source is modulated and the output signals from each sensor are demodulated and then logarithmically combined to provide two log $I/I_o$ signals. Compensation circuitry connected to the logarithmic circuit arrangement provides compensation for radiation absorption deviations of the radiation passing through the flame as a function of Beer's Law. The system also includes circuitry for providing a zeroing adjustment of each log $I/I_o$ signal while a known standard or blank is being introduced into the flame.

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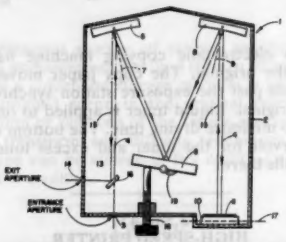
**3,586,442**

**ZERO DISPERSION DOUBLE MONOCHROMATOR**

**Robert W. Tripp, Tuckahoe, N.Y., assignor to Farrand Optical Co., Inc., New York, N.Y.**

**Filed Nov. 29, 1968, Ser. No. 780,060**
**Int. Cl. G01j** *3/18*
**U.S. Cl. 356—99** **7 Claims**




A zero dispersion double monochromator wherein light from an entrance aperture which has been collimated is spectrally dispersed and reimaged only in the meridian (direction) corresponding to the direction of dispersion. A reflecting device located at the spectrum so formed is tilted about an axis parallel to the direction of dispersion to reflect the light back to the same system to form an image of the entrance aperture at an exit aperture which is displaced from the entrance aperture in a direction normal to the direction of dispersion.

A mask is placed over the reflecting device for blocking a portion of the light so that light having a desired spectral content is reflected.

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**3,586,443**

**CIRCULAR DICHROISM MEASUREMENT SYSTEM**

**Gerald E. Hooper, La Canada, Calif., assignor to Cary Instruments, Monrovia, Calif.**

**Filed Apr. 22, 1968, Ser. No. 723,188**
**Int. Cl. G01n** *21/40*
**U.S. Cl. 356—114** **26 Claims**

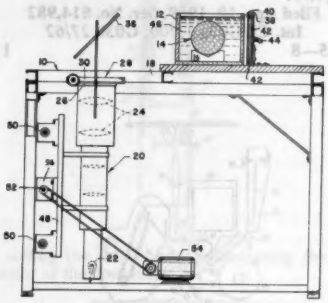
The disclosure concerns the provision of means for significantly reducing certain inaccuracies associated with circular dichroism measurement, and in which a certain signal (alternately proportional to sample characteristic transmission values for predominantly right-circularly polarized light and left-circularly polarized light) is processed to produce a modified signal proportional (within a predetermined additive constant) to the logarithm of the certain signal, the AC component of the modified signal being used in indicating the value of circular dichroism.

3,586,444

## STRIAESCOPE FOR INSPECTING A TRANSPARENT OBJECT SUBMERGED IN A LIQUID HAVING THE SAME INDEX OF REFRACTION

Merrill F. Sproul, Sturbridge, and Richard D. Courtemanche, Southbridge, both of, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Jan. 30, 1970, Ser. No. 7,134
Int. Cl. G01n *21/16, 21/46*
U.S. Cl. 356—129 4 Claims



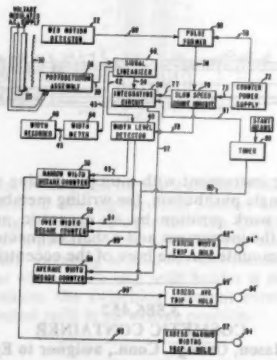
A device for photographically recording the location and amount of striae, cracks and inclusions in long rods of glass. A rod of glass placed in an immersion liquid having an index of refraction matching that of the rod is scanned from one end to another thereof by a slit of high intensity collimated light directed into the rod perpendicularly to its axis and a strip of photographic film extending along the length of the rod is exposed by portions of the scanning light transmitted through the rod whereby a shadowgraphic recording of the striae, cracks and/or inclusions is produced upon the film.

3,586,445

## APPARATUS FOR MONITORING THE WIDTH OF A RUNNING WEB AND INDICATING THE AMOUNTS OF LENGTH WHICH ARE OVER WIDTH, UNDER WIDTH, AND AVERAGE WIDTH

James Henry Martin, Jr., Waynesboro, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 25, 1969, Ser. No. 810,237
Int. Cl. G01b *11/04;* G01n *21/30;* H01j *39/12*
U.S. Cl. 356—159 2 Claims



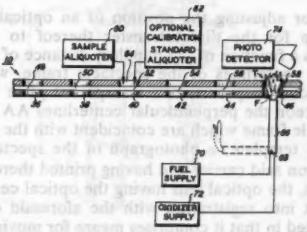
A web width monitor which includes a long-line infrared light source located on one side of a running web and parallel to the width dimension to be monitored, a primary photodetector arranged on the opposite side of the web, and a motion detector and pulse former arranged to provide electrical control signals related to length of web motion. A reference photodetector is connected in series with the primary photodetector device and arranged to minimize signal drift due to ambient and circuit operating temperature changes. A first subcircuit linearizes the width indicating photo signal and impresses it on a meter and recorder. This first subcircuit is also connected to a signal integrator circuit arranged to provide counter signal pulses at a recurring rate proportional to tow width. These signals are impressed on a decade counter for a timed interval regulated by a timer device. This provides a readout of integrated average tow width over the time interval. The first subcircuit is, in addition, arranged to furnish analog width signals to a width level detector circuit which is arranged to gate a counter power circuit which in turn is connected to the web motion detector. The counter power circuit is separately gated to two decade counters, one arranged to indicate web length which has greater than a specified width and the other length of web having less than a predetermined width. Each counter is connected to a trip and hold alarm circuit which is actuated when that counter reaches a preselected level.

3,586,446

## FLAME PHOTOMETER

Eugene Findl, Granada Hills; Mani L. Bhaumik, Pasadena, and Isidor M. Schneider, Los Angeles, all of, Calif., assignors to Xerox Corporation, Rochester, N.Y.

Filed Sept. 14, 1967, Ser. No. 667,693
Int. Cl. G01j *3/34;* G01n *21/54*
U.S. Cl. 356—187 10 Claims



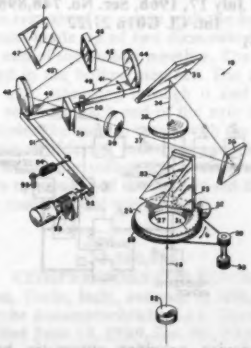

This invention relates to a flame photometer having a transport tape, external to the gas burner, for transporting a measured portion of sample material from a remote location to the spectral flame for analysis.

3,586,447

## SPLIT IMAGE MEASURING DEVICE FOR A MICROSCOPE

David W. Vollmer, Brighton, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 16, 1969, Ser. No. 825,356
Int. Cl. G01b *9/04*
U.S. Cl. 356—163 4 Claims



An auxiliary device for microscopes whereby the image formed by the microscope objective is divided by beam dividers into two parts which form two split images which are movable for the purpose of measuring linear distances in the

object plane of the microscope, and for measuring such distances along any meridian in said plane.

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**3,586,448**

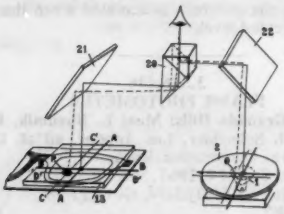
## METHOD AND APPARATUS FOR POSITIONING A LENS BLANK RELATIVE TO A PHOTOGRAPH OF A WEARER

**Jacques Beasse, Paris, France, assignor to Societe Des Lunetiers, Temkine & Cie, Paris, France**

**Continuation of application Ser. No. 619,261, Feb. 28, 1967, now abandoned. This application May 8, 1970, Ser. No. 33,171**

**Int. Cl. B23q** *17/18;* **G01b** *11/27*

**U.S. Cl. 356—172** **14 Claims**



Device for adjusting the position of an optical lens on a suction cup for the direct transfer thereof to a grinding machine, as a function of the pupillary distance of the wearer and of the centerlines of the spectacle frame, which comprises a suction-cup carrier, a transparent plate having engraved thereon the perpendicular centerlines AA and BB of the spectacle frame which are coincident with the centerlines of the lens template, a photograph of the spectacle frame, positioned on said carrier and having printed thereon the pupillary axes, the optical lens having the optical centerlines to be brought into registration with the aforesaid centerlines, characterized in that it comprises means for moving said suction-cup carrier to the position of coincidence of its center with the point of intersection of the axes of the spectacle frame or a homologous point, means for bringing the optical center of the lens to a position of coincidence with the pupillary axis of the photographed eye or homologous point, other means carrying fixed crosslines corresponding with the axis of the suction-cup carrier and movable crosslines adapted to locate, between said points, the center of the pupil and the optical center of the lens.

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**3,586,449**

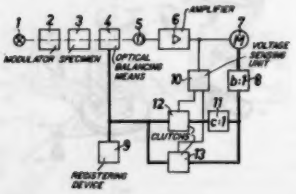
## VARIABLE SPEED OPTICAL BALANCE IN PHOTOMETRIC MEASURING INSTRUMENTS

**Heinz Riegler, Jena, Germany, assignor to VEB Carl Zeiss, Jena, Germany**

**Filed July 17, 1968, Ser. No. 748,898**

**Int. Cl. G01n** *21/22*

**U.S. Cl. 356—201** **3 Claims**




A followup device provides automatic balance in a photometric measuring instrument. The setting time of this device is shortened by moving the optical balancing means at comparatively high velocity and slowing it down only in the immediate neighborhood of the balance. Every change of velocity depends on the value of the output voltage of the measuring instrument and is due to the connection of one of two clutches, each of which engages a corresponding gear system between a servomotor and the balancing means.

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**3,586,450**

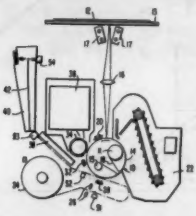
## FAILSAFE SYSTEM FOR COPYING MACHINE

**Richard E. Hosey, Ironton, Ohio; Thomas A. Hoskins; Myron F. Shlatz, and James W. Stanley, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Apr. 10, 1969, Ser. No. 814,982**

**Int. Cl. G03g** *15/00;* **G03b** *27/62*

**U.S. Cl. 355—8** **11 Claims**



A failsafe system is provided for a copying machine which will operate in response to one of a plurality of sensing devices to stop the xerographic copying process, immediately deenergize the fuser assembly and energize an auxiliary drive system which will merely return the reciprocatable document carriage to the home position so that the original document may be retrieved. When the document carriage reaches the home position, the auxiliary drive system will be shut off with the cover latching mechanism deactivated to prevent the initiation of further cycles until such time as repairs are made and the system is reset for normal operation.

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**3,586,451**

## WRITING INSTRUMENT

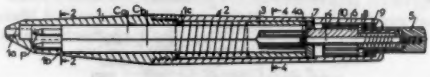
**Raimondo Canton, Usseaux di Genestrelle, Turin, Italy**

**Filed Dec. 13, 1968, Ser. No. 783,677**

**Claims priority, application Italy, Dec. 14, 1967, 41405A/67**

**Int. Cl. B43k** *27/08, 24/16*

**U.S. Cl. 401—33** **3 Claims**



In a writing instrument with multiple writing members actuated by a single pushbutton, the writing member selected is brought into work position by an eccentric pusher in the lower part of the instrument and a shaft connected to a pushbutton freely mounted in the bore of the eccentric pusher.

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**3,586,452**

## COSMETIC CONTAINER

**Richard A. Mason, Orange, Conn., assignor to Eyelet Specialty, Wallingford, Conn.**

**Filed June 25, 1969, Ser. No. 836,290**

**Int. Cl. B43k** *21/08;* **A45d** *40/06*

**U.S. Cl. 401—78** **9 Claims**

The invention contemplates a container for the efficient containment and selective dispensing of chalk or talc in stick form, as for cosmetic use. The arrangement is such as to provide self-adaptation to changing stick size, as may be occasioned by erosion in use. The arrangement also provides the facility of use which characterizes a conventional rotary or

swivel lipstick, and special provision is made to assure the accumulation and storage of chalk or the like dust, in a manner

to avoid soiling the hands or contaminating the otherwise clean exterior of the container.

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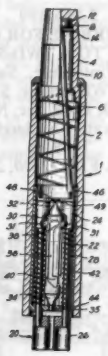
**3,586,453**
**WRITING PEN**
**Gerold Anderka, Hamburg, Germany, assignor to Riepe-Werk, Hamburg, Germany**
**Filed Dec. 12, 1969, Ser. No. 884,630**
**Claims priority, application Germany, Dec. 17, 1968, P 18 15 007.7**
**Int. Cl. B43k 27/12**
**U.S. Cl. 401—33** **9 Claims**



A multicolor writing pen having a plurality of refill holders, selecting means for moving the refill holders and a switching element having a rotatable cylinder. The peripheral surface of the cylinder is provided with a plurality of cam tracks; and each cam track engaging a follower associated with a refill holder so that when a selected refill holder is moved into its operative position, the switching element rotates so that it holds the selected refill in its writing position.

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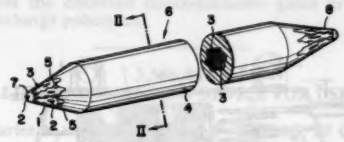
**3,586,454**
**PENPOINT STRUCTURE OF WRITING IMPLEMENTS**
**Takaji Funahashi, No. 1, 2-chome, Kitatakasho-machi, Nishi-ku, Nagoya-shi, Aichi-ken, Japan**
**Filed Nov. 18, 1969, Ser. No. 877,666**
**Claims priority, application Japan, July 19, 1969, 44/68633**
**Int. Cl. B43k 8/00**
**U.S. Cl. 401—198** **5 Claims**

This invention provides an improved structure of the point of a writing pen and inks contained in this invention can be sucked up spontaneously by the means of fine tube openings formed in penpoint core elements and of fine spaces formed



between the sheath and core elements as well as between adjoining core elements thereby increasing writing efficiency of the pen.

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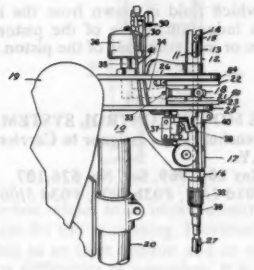
**3,586,455**
**TAPPING MACHINE**
**Steve Csencsics, Erie, Pa., assignor to Cerbco, Inc., Erie, Pa.**
**Filed Feb. 8, 1968, Ser. No. 704,116**
**Int. Cl. B23g 1/00**
**U.S. Cl. 408—9** **4 Claims**



The tapping machine disclosed herein is made up generally of a stand, quill and motor of the familiar type. The machine has an improved clutch-engaging means and an improved means to connect the quill to the clutch. The clutch is made up of two coaxial counterrotating pulleys which are belt driven from the motor. Each pulley has a friction surface on the side face adjacent the other pulley. A friction spool made up of two spaced coaxial discs and fixed to a hollow member, which is journaled in the stand. A fork is connected to the spool to selectively move it into engagement with either of the frictional surfaces. The fork is pivoted to the stand and an air-actuated cylinder has a piston rod engaging an end of the fork to swing it about its pivot.

The machine has a handle to move the quill up and down. A cam is fixed to the quill. The cam actuates a valve to connect air to said air cylinder when the quill is moved toward the work.

The quill is restrained to rotate with the hollow member by a unique means made up of two diametrically opposite slots in the upper end of the hollow member. The quill is telescopically received in the hollow member. The upper end of the quill has an axle extending through it and projecting from each side. A roller on each end of the axle is received in the slots and restrains the quill to rotate with the hollow member. The rollers are antifriction members and thus when the tap engages the work, the rollers freely slide and no frictional force opposes movement of the tap toward the work as is the case with the conventional splined quill.

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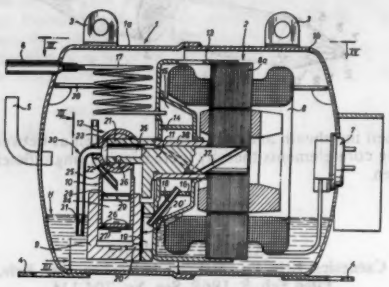
**3,586,456**
**COMPRESSORS FOR FLUIDS**
**Dante Giacosa, Turin, Italy, assignor to SIRA Societa Industriale Ricerche Automotoristiche S.r.l., Turin, Italy**
**Filed June 13, 1969, Ser. No. 833,055**
**Claims priority, application Italy, June 17, 1968, 52068-A/68**
**Int. Cl. F04b 39/00, 39/02**
**U.S. Cl. 417—312** **9 Claims**

A compressor for fluids, particularly the working fluid in a refrigerator, has a motor-compressor unit resiliently

suspended within a sealed casing, for example by means of a wire frame suspension. The motor of said unit reciprocates a compressor piston which is formed with at least one interior



chamber through which fluid is drawn from the interior of the casing on each induction stroke of the piston, thereby silencing the suction or induction side of the piston.

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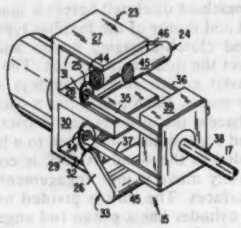
**3,586,457**

**A PRIME MOVER CONTROL SYSTEM**

**Carl H. Geary, Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.**

**Filed May 20, 1969, Ser. No. 826,107**
**Int. Cl. F01d** *1/12*; **F03b** *1/00*; **F03d** *5/00*
**U.S. Cl. 415—36** **6 Claims**



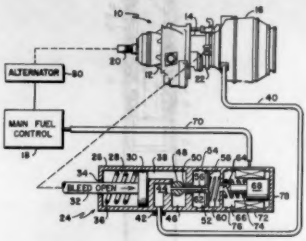
A prime mover control system for controlling the speed of a fluid-actuated machine comprising a rotatable element responsive to the speed of the machine. Connected to rotate with the speed responsive element are a plurality of S-shaped band means. Engaging a first portion of each of the band means and rotatable therewith, is a weight. The centrifugal force produced by the rotating weights causes the weights to move axially and radially relative to the band means, the magnitude of movement being in direct proportion to the centrifugal force and thus also to the speed of the machine. The band means transmits the axial movement of the weights to a roller engaging a second portion of each of the band means, the rollers moving axially relative to the band means in the same direction as the axial movement of the weights and in direct proportion thereto. The roller means connect through means such as levers, a throttle valve controlling the supply of actuating fluid to the machine, the axial movement of the roller means causing a corresponding movement in the throttle valve, thereby either increasing the quantity of actuating fluid or decreasing the quantity of actuating fluid to maintain a predetermined speed for the machine.

**3,586,458**

**BLEED CONTROL ACTUATOR FOR GAS TURBINE ENGINE**

**Paul A. Avery, Shelton, Conn., assignor to Avco Corporation, Stratford, Conn.**

**Filed Sept. 16, 1969, Ser. No. 858,374**
**Int. Cl. F01b** *25/00*
**U.S. Cl. 415—28** **8 Claims**




The disclosure illustrates an actuator which controls the opening and closing of an interstage bleed valve for a gas turbine engine multistage air compressor. The actuator has a power piston and output rod adapted to close the bleed valve in response to pressurization by discharge air from the compressor. A valve assembly is provided in the actuator to control the flow to the power piston and thus control the opening and closing of the bleed valve. The valve assembly maintains the power piston in a position which opens the bleed valve in the absence of an exterior control signal for startup engine-operating conditions. The valve assembly reverses its logic for normal engine-operating conditions and maintains the power piston in a position which closes the bleed valve in the absence of an exterior control signal.

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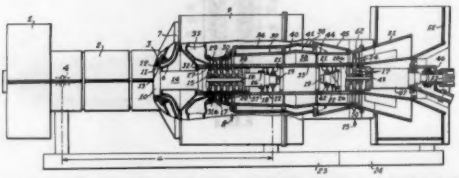
**3,586,459**

**MULTISTAGE GAS TURBINE FOR CONVERSION FROM A SINGLE-SHAFT TO A TWO-SHAFT TURBINE**

**Ferdinand Zerlauth, Winterthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland**

**Filed Apr. 30, 1969, Ser. No. 820,435**
**Claims priority, application Switzerland, May 20, 1968, 7489/68**
**Int. Cl. F10l** *13/00*, *25/16*
**U.S. Cl. 415—60** **5 Claims**



Various basic components of the turbine are made in standardized manners so as to be converted from a single-shaft turbine to a two-shaft turbine and vice versa. The rotor discs are made to be incorporated as a last stage in a compressor turbine or incorporated in the useful power turbine when the second shaft is added.

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**3,586,460**

**ROTOR BLADE VARIABLE MODULUS TRAILING EDGE**

**Charles V. Toner, Wallingford, Pa., assignor to The United States of America as represented by the Secretary of the Air Force**

**Filed May 14, 1969, Ser. No. 824,534**
**Int. Cl. B64c** *11/18*
**U.S. Cl. 416—144** **3 Claims**

A helicopter rotor blade is provided with a trailing edge of hollow construction to form a cavity in which materials of

various weights and densities is contained. The structural and aerodynamic properties of the rotor blade are enhanced by

controlling the mixture of the modulus fibrous materials contained in the trailing edge cavity.

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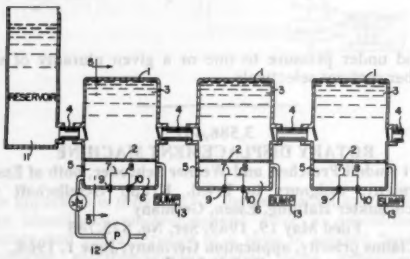
3,586,461
SONIC MULTISTAGE PUMP
Paul M. Erlandson, Palos Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Jan. 16, 1969, Ser. No. 791,688
Int. Cl. F04b 9/10, 23/04, 43/02
U.S. Cl. 417—379 5 Claims




An electrohydraulic multistage pump is composed of a series of stages, each stage being connected to the next stage so that when an electric pulse is applied in a stage, fluid is displaced into a succeeding stage and at this time, an electric spark passes across the arc gap to augment the pressure in the succeeding stage. The stages are arced at proper times so that the arc occurs when each stage is under pressure from the sonic wave actuated or caused by the preceding stage. A considerable pressure is developed at the output by the series of electrical pulses operating to raise the pressure in successive stages.

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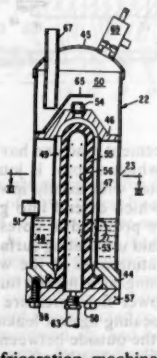
3,586,462
ABSORPTION REFRIGERATION MACHINE PUMP
Kenneth K. Kaiser, Camby, and Richard A. English, Indianapolis, both of, Ind., assignors to Carrier Corporation, Syracuse, N.Y.
Filed May 1, 1969, Ser. No. 820,753
Int. Cl. F04b 9/10; F17c 7/02
U.S. Cl. 417—394 7 Claims



An absorption refrigeration machine having a generator and condenser on the high side thereof and an evaporator and absorber on the low side employing a pulser-type solution pump to minimize "slugging," transfer noncondensible gases and solution from the low side to the high side of the machine, store noncondensible gases on the high side thereof and utilize the collected noncondensible gases to dampen pump discharge pulsations.

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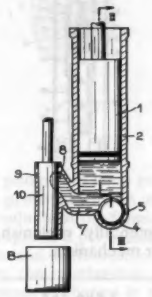
3,586,463
FILLING AND METERING DEVICE FOR USE IN CANNING
Jean Charles Marchadour, 40, rue P. Borrossi, 29 Quimper, France
Filed June 3, 1969, Ser. No. 830,037
Claims priority, application France, June 12, 1968, 154,745
Int. Cl. F04b 27/00, 13/00
U.S. Cl. 417—437 5 Claims



The invention relates to an improvement in filling and metering devices for use in canning. Previous proposals use the same conduit as an inlet conduit and an outlet conduit and this presents difficulties in operation. It is also an object of the invention to have a circular path for the cans being filled as short as possible whilst minimizing centrifugal force and to accommodate all the necessary mechanisms whilst keeping the filling orifice as near the center of the filling machine as possible. These objects are realized by using a metering piston and a separate stripping cylinder with a piston constituting a closure valve, the metering cylinder having an outlet chamber which has a plug and socket inlet and an outlet conduit communicating with the stripping cylinder, the outlet orifice of the outlet conduit being wholly above the adjacent end face of the metering piston at the level reached by the piston in its wholly retracted position within its cylinder.

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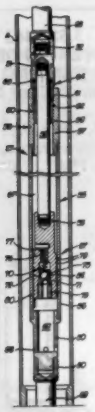
3,586,464
SUCKER ROD COMPENSATOR FOR SUBSURFACE WELL PUMPS
Talmadge L. Crowe, Houston, Tex., assignor to Baker Oil Tools, Inc., City of Commerce, Calif.
Filed Dec. 9, 1969, Ser. No. 883,564
Int. Cl. F04b 3/00, 47/08; F04h 21/00
U.S. Cl. 417—554 20 Claims

A compensator located in a sucker rod string adjacent to a deep well pump and embodying upper and lower telescopically arranged devices, one of said devices being a piston mechanism, the other of the devices being a cylinder mechanism in which the piston mechanism is telescopically arranged. A liquid supply trapped in the cylinder mechanism and originating from the well bore fluid transmits linear motion between the piston and cylinder mechanisms, the liquid being forced in small increments past the piston mechanism out of the cylinder mechanism of each upward stroke of the sucker rod string and compensator, allowing the upper device to shift in step-by-step fashion progressively relatively upwardly of the lower device to increase the overall length of the compensator, until the travelling valve of the pump taps against the standing valve of the pump. When this occurs, the upper device overrides or moves slightly downward of the

lower device, causing fluid in the well bore to flow into the cylinder mechanism through a check valve in the piston



mechanism to incrementally replenish the liquid supply trapped in the cylinder mechanism.

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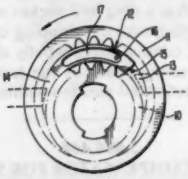
**3,586,465**
**INTERNALLY TOOTHED GEAR PUMP**
**Georg Eltze, Stuttgart, Riedenberg, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany**
**Filed Dec. 29, 1969, Ser. No. 888,559**
**Claims priority, application Germany, Dec. 27, 1968, P 18 17 165.8**
**Int. Cl. F01c *1/10***
**U.S. Cl. 418—126** **24 Claims**



A gear pump, especially for the pressure medium supply of automatic transmissions of motor vehicles, in which an approximately sickle-shaped segment is arranged between the externally toothed gear and the internally toothed gear; the segment includes a hollow space which is open axially toward both sides and which is in communication in the radial direction by at least one bore each with the sealing surfaces for the externally toothed gear and to the internally toothed gear.

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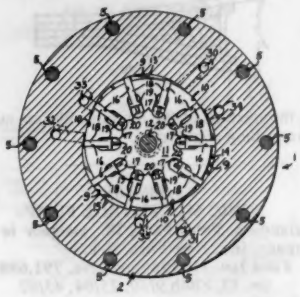
**3,586,466**
**ROTARY HYDRAULIC MOTOR**
**Albin R. Erickson, 409 3rd Ave. N.E., Roseau, Minn.**
**Filed Dec. 2, 1969, Ser. No. 881,420**
**Int. Cl. F01c *21/00, 1/00, 11/00***
**U.S. Cl. 418—80** **5 Claims**

A rotary hydraulic motor including body structure and a vaned rotor journaled therein defining a plurality of the pressure chamber sections for reception of fluid under pressure from a common source, and valve means for controlling flow



of fluid under pressure to one or a given plurality of said chamber sections selectively.

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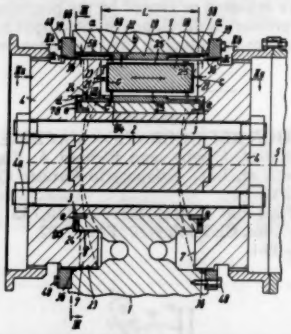
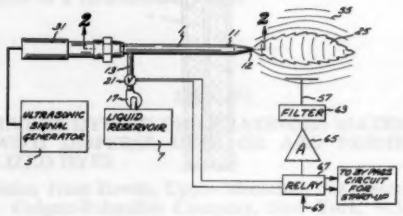
**3,586,467**
**ROTARY DISPLACEMENT MACHINE**
**Robert Rudolf Prescher, and Werner Schroder, both of Essen, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany**
**Filed May 19, 1969, Ser. No. 825,745**
**Claims priority, application Germany, June 1, 1968, P 17 50 763.0**
**Int. Cl. F01c *19/00***
**U.S. Cl. 418—139** **29 Claims**



Rotary fluid displacement machine having a housing with a cylindrical cavity in which a rotor is journaled and wherein the rotor has end plates with axially inwardly extending undulating projections which extend into grooves in the housing. Sliding blocks are provided in bores in the housing and at their ends engage said undulating surfaces to form working chambers with alternating ones of the working chambers at each side of the housing at a higher fluid pressure and the others thereof at a lower fluid pressure at any instant, and sliding seal elements sealing against leakage of fluid from the working chambers to the outside between the rotor and housing and between working chambers toward the inside of the housing.

3,586,468
**BURNER COMBUSTION CONTROL INCLUDING ULTRASONIC PRESSURE WAVES**
Anker Victor Sims, Redondo Beach, and Paul Weller Reed, Los Angeles, both of, Calif., assignors to A. E. Gosselin Engineering (Incorporated), Los Angeles, Calif.
Filed Sept. 16, 1968, Ser. No. 759,997
Int. Cl. F23n *1/00*
U.S. Cl. 431—1 2 Claims




An apparatus is provided for the generation and detection of an identifiable electromagnetic wave to determine the presence and characteristics of a zone of ionized fluid, the identifiable electromagnetic signal being generated by propagation of an ultrasonic pressure wave in said fluid, with a receiving means being used to detect and amplify the resultant signal.

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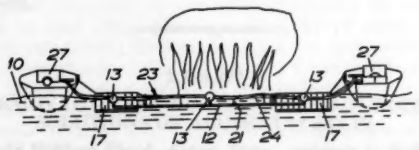
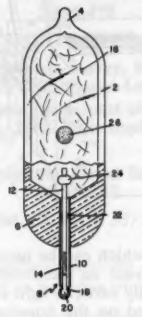
3,586,469
**PROCESS OF BURNING-OFF OIL ON THE SURFACE OF WATER BASINS**
Alexis Molin, Saltsjobaden, and Osten Carlsson, Nacka, both of, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Dec. 26, 1968, Ser. No. 786,976
Claims priority, application Sweden, Jan. 5, 1968, 175/1968
Int. Cl. F23c *5/00*
U.S. Cl. 431—8 7 Claims



Method and means are presented for destroying drifting oil layers on the surface of water basins by sustained combustion in a zone contiguous to the oil layer and in relative motion with respect thereto. In the method for thus combating drifting oil, a plurality of jets of combustion sustaining gas, in particular compressed air, are blown against the oil layer in said zone for sustaining combustion therein. In the combating means a hollow element is connected to a source of pressure gas, in particular compressed air, and kept afloat at the surface of the water with longitudinally spaced discharge openings on the element blowing the pressure gas against the oil layer in said zone for sustaining combustion therein.

3,586,470
**PHOTOFLASH LAMP**
Stephen V. Brown, and John W. Shaffer, both of Williamsport, Pa., assignors to Sylvania Electric Products Inc.
Filed Nov. 19, 1969, Ser. No. 878,077
Int. Cl. F21k *5/02*
U.S. Cl. 431—13 6 Claims



A percussive-type photoflash lamp in pH the inner wall of the lamp envelope is provided with an indicator spot sensitive to the combustion products of the fulminating material of the primer. The spot comprises a pH indicator sensitive to these combustion products and a fluorescent pigment insensitive thereto. Exposure to the combustion products of the fulminating material causes a change in the pH indicator and thus either masks or exposes the fluorescent pigment depending upon the particular indicator used. In either case, the responsiveness of the fluorescent pigment to ultraviolet light or the lack of it constitutes an automatic means for ascertaining the condition of the fulminating material.

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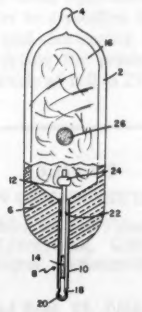
3,586,471
**PHOTOFLASH LAMP**
Thomas B. McDonough, Allenwood, and John W. Shaffer, Williamsport, both of, Pa., assignors to Sylvania Electric Products Inc.
Filed Nov. 19, 1969, Ser. No. 878,163
Int. Cl. F21k *5/02*
U.S. Cl. 431—13 4 Claims



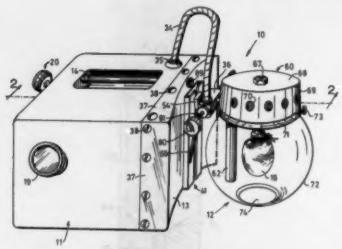
A percussive-type photoflash lamp in which the inner wall of the lamp envelope is provided with an indicator spot containing a fluorescent dye sensitive to the combustion products of the fulminating material of the primer in order to permit automated inspection and rejection of those lamps or subassemblies thereof during manufacture in which the fulminating material has been flashed inadvertently. Refractive pigments substantially transparent to ultraviolet light are included to obtain easier visual inspection in ordinary light and a substantial increase in emitted light intensity under ultraviolet light.

3,586,472

## PORTABLE LANTERNS

George K. Clifton, 105 Christie St., Toronto, Ontario, Canada

Filed June 27, 1969, Ser. No. 837,204
Int. Cl. F21h *1/00*
U.S. Cl. 431—109 9 Claims



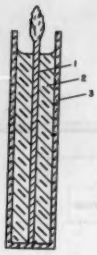
A portable lantern which can be used both as a handheld unit and suspended from an overhead support includes a housing with a generally vertical, light-reflecting surface and a light source mounted on the housing opposite the light-reflecting surface and for movement between a raised position and a lowered position. With the light source in the raised position, light is reflected forwardly of the lantern while, with the light source in its lowered position, illumination provided below the lantern is not interrupted by the housing. In a specific structure, the housing also serves as a fuel tank and a mantle and an associated globe are movably mounted on a vertical guideway on a reflective end wall of the fuel tank.

3,586,473

## COLORED FLAME CANDLE

Raymond A. Galloway, 4800 Osage St., College Park, Md., and Jan Stephen Carter, Rte. 4, Box 29, Sykesville, Md.

Filed June 23, 1969, Ser. No. 835,783
Int. Cl. F23q *2/32*
U.S. Cl. 431—126 1 Claim



A candle which burns with a colored flame. The candle has an inner body of solid combustible material, through which extends a wick. The inner body is coated with a higher melting temperature combustible material. Into the outer coating is incorporated a material, which, when exposed to the heat of the flame, yields a flame of a desired color.

3,586,474

## BLEACHING PROCESS

Xavier Kowalski, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed June 11, 1969, Ser. No. 832,489

Int. Cl. D06l 3/06

U.S. Cl. 8—108 2 Claims

The bleaching action of solutions of chlorocyanuric acids, salts and complexes is improved and the corrosivity of such solutions reduced by the inclusion therein of a taurate of a saturated fatty acid.

3,586,475

## SOLVENT DYEING OF KERATINOUS MATERIALS WITH DISPERSE DYES OR AZO PREMETALLIZED DYES

Gordon Trent Hewitt, Upper Montclair, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Nov. 18, 1966, Ser. No. 595,373

Int. Cl. A61k 8/12

U.S. Cl. 8—10.1 10 Claims

Keratinous materials such as hair can be dyed with disperse dyes or azo premetallized dyes in an alcoholic-aqueous medium with a solvent assist adjuvant such as lower alkyl N,N-dimethyl amides and alkyl N,N-N',N'-tetramethyl amides.

3,586,476

## METHOD OF STRIPPING IONS FROM AN ION-EXCHANGE LIQUID

Heinz P. Beutner, Lexington, and Paul A. Huska, Carlisle, Mass., assignors to Arthur D. Little Inc., Cambridge, Mass.

Filed Oct. 16, 1968, Ser. No. 768,033

Int. Cl. C01f 7/66

U.S. Cl. 23—102 6 Claims

An improved method for stripping ferric ions from an organic ion-exchange liquid with an acid characterized by the steps of washing the ion-exchange liquid with water prior to and subsequent to the stripping to prevent the transport of unwanted anions between the aqueous liquid streams.

3,586,477

## REMOVAL OF FERRIC IRON FROM AQUEOUS SOLUTIONS OF ALUMINUM SALTS

Harold William Flood, Acton, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

No Drawing. Filed Oct. 16, 1968, Ser. No. 768,180

Int. Cl. C01f 7/66, 7/74

U.S. Cl. 23—102 6 Claims

An ion-exchange liquid and method of using it for extraction of relatively small amounts of ferric iron from aqueous solutions of aluminum salts of nitric, sulfuric or hydrochloric acid. The ion-exchange liquid comprises a water-immiscible organic liquid carrier and a mixture of di(2-ethyl-hexyl) hydrogen phosphate and tributyl phosphate or a primary amine. When it is brought into direct contact with the aqueous solution, the ferric iron ions are transferred to the ion-exchange liquid from the aqueous solution to be purified.

3,586,478

## SYNTHETIC HECTORITE-TYPE CLAY MINERALS

Barbara Susan Neumann, Surrey, England, assignor to Laporte Industries Limited

No Drawing. Continuation-in-part of application Ser. No. 298,401, June 20, 1963. This application July 5, 1967, Ser. No. 651,107

Claims priority, application Great Britain, June 26, 1962, 24,527/62

Int. Cl. C01b 33/28

U.S. Cl. 23—111 8 Claims

Production of synthetic swelling clays of the type of hectorite by forming an aqueous slurry from

(i) a water soluble magnesium salt
(ii) sodium silicate
(iii) sodium carbonate or sodium hydroxide, and
(iv) material delivering lithium and fluoride ions selected from the group consisting of (A) lithium fluoride and (B) a lithium compound in conjunction with hydrofluoric acid, fluosilicic acid, sodium silico fluoride or sodium fluoride; such that in the slurry the following atomic ratios are present

$$\frac{Si}{F}=0.5 \text{ to } 5.1; \qquad \frac{Li}{Mg}=0.1 \text{ to } 1.0;$$

$$\frac{Si}{Mg+Li}=0.1 \text{ to } 1.5; \qquad \frac{Na}{2\,Mg+F-Li}=1.0 \text{ to } 2.0,$$

the aqueous slurry being formed by co-precipitation by slowly combining the said magnesium salt; the acid sodium silicate; the said sodium carbonate or hydroxide, with heating and agitation, in an aqueous medium which contains the said material delivering the lithium and fluoride ions;

taking the aqueous slurry so formed and without washing it free from soluble salts, hydrothermally treating it for about 10 to 20 hours to crystallise the synthetic mineral-like clay; washing and dewatering the resulting crystallised product and drying the product at a temperature up to 450° C., preferably at 110 to 250° C.

3,586,479

## PRODUCTION OF SYNTHETIC FAUJASITE

Gerhard Heinze, Schildgen, and Friedrich Schwochow and Horst Weber, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Sept. 23, 1968, Ser. No. 761,803

Int. Cl. C01b 33/28

U.S. Cl. 23—112 11 Claims

Process for the production of synthetic zeolites with faujasite structure wherein an alumina-containing sodium boro-silicate glass containing at least 0.8 mol of sodium oxide per mol of each $Al_2O_3$, $SiO_2$ and $B_2O_3$ is prepared and thereafter divided to small particles, whereupon the glass particles are converted to the crystalline zeolite by heating an aqueous mixture of the glass particles to about

60–100° C. over a period of time sufficient to form the desired faujasite zeolite, the water to form the aqueous mixture being used in an amount of from about 400–1400 ml. per 100 g. of glass.

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**3,586,480**
**PROCESS FOR TREATING ORES AND MINERAL MIXTURES**

**Ernest Raymond Ground, Melchor Muzquiz, Coahuila, Mexico, assignor to Continental Ore Corporation, New York, N.Y.**

**No Drawing. Filed May 27, 1968, Ser. No. 732,085**
**Int. Cl. C01f *11/46*; C01b *25/12***
**U.S. Cl. 23—122** **3 Claims**

A process is provided for concentrating phosphorus oxide or barium sulfate-bearing ores by the selective removal of calcium carbonates and oxides. The ore is roasted for a period not exceeding about 120 minutes followed by leaching with an aqueous solution of ammonium chloride. Phosphorus oxide or barium sulfate losses from the insoluble residue to the filtrate are insignificant and the insoluble residue remains in a chemical and physical state very favorable to further processing. Control of time and temperature is necessary to prevent the formation of insoluble calcium compounds.

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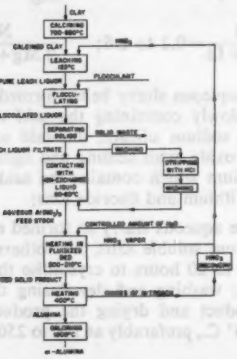
**3,586,481**
**METHOD FOR EXTRACTING PURE ALPHA-ALUMINA FROM CLAYS**

**Richard W. Hyde, Lexington, and Stanley V. Margolin, Auburndale, Mass., assignors to Arthur D. Little Inc., Cambridge, Mass.**

**Filed Oct. 16, 1968, Ser. No. 768,112**
**Int. Cl. C01f *7/02***
**U.S. Cl. 23—141** **13 Claims**

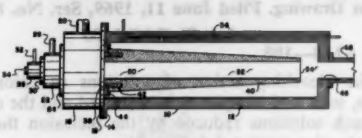



A method for converting the aluminum contained in clays to $\alpha$-alumina which is of sufficient purity to permit its direct reduction to aluminum metal in a Hall electrolytic cell. The method includes calcining the aluminum-containing clay leaching the calcined clay with aqueous nitric acid, flocculating the insoluble impurities to aid in their separation by settling and filtration, contacting the filtrate with an ion-exchange liquid to remove the soluble ferric iron along with other metallic impurities, introducing the substantially pure aluminum nitrate solution into a fluidized bed of the product alumina maintained at a temperature preferably between about 200 and 210° C., and having a fluidizing gas containing a controlled amount of water vapor to hydrolyze the aluminum nitrate, thus making it possible to remove about 90 to 95% of the nitrate as nitric acid vapor, and finally heating the hydrolyzed dry product from the fluidized bed to drive off the remaining nitrate as oxides of nitrogen, and converting these solids to $\alpha$-alumina.

**3,586,482**
**APPARATUS AND PROCESS FOR PRODUCING CARBON BLACK**

**Kenneth D. Hewitt, Houston, Tex., assignor to Continental Carbon Company, Houston, Tex.**

**Filed Apr. 16, 1969, Ser. No. 816,706**
**Int. Cl. C09c *1/50***
**U.S. Cl. 23—209.4** **8 Claims**



Apparatus and process for producing oil furnace carbon black by the thermal decomposition of select carbon black forming hydrocarbon feedstocks in an elongate reactor having a reactor housing enclosing a reaction tube. The raw material components are axially injected into the reaction tube subsequent to passage through at least two axially aligned vortex units. A hydrocarbon fuel, an oxygen-containing gas and the hydrocarbon feedstock are introduced tangentially into separate vortex chambers having axially aligned and connected apertures to cause rapid mixing by the application of sheer forces. The combustion mixture of the oxygen-containing gas and fuel introduced under pressure is ignited and combusted to cause the feedstock to be rapidly decomposed to carbon black and combustion gases in the reaction tube. The reaction products and partially formed carbon black pass through the reaction tube and are subjected to cooling upon formation of the black by passing the effluent through a void space between the end of the tube and a central aperture at the downstream end of the reactor housing. The cooling is effected by the circulation of a coolant medium through the reactor housing shell so the stream of combustion products and black can be recovered from the reactor for separation of the carbon black from said products without water quenching.

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**3,586,483**
**METHOD FOR DETECTING THE PRESENCE OF TETRACYCLINE ANTIBIOTICS**

**John Gerard Heider, West Nyack, and Robert Gerard Kelly, Monsey, N.Y., assignors to American Cyanamid Company, Stamford, Conn.**

**No Drawing. Continuation-in-part of application Ser. No. 675,055, Oct. 13, 1967. This application Oct. 14, 1968, Ser. No. 767,515**
**Int. Cl. G01n *21/06, 21/38, 33/16***
**U.S. Cl. 23—230** **6 Claims**

A fast, reliable test is provided for detecting the presence of tetracycline antibiotics in biological fluids, such as urine, by adsorbing a portion of the fluid on an adsorbent strip containing a complexing metal that forms a fluorescent metal complex with the antibiotic and observing the fluorescence of the metal complex under ultraviolet light. This test method is particularly useful in allowing clinicians to quickly and reliably determine whether patients on tetracycline therapy have received their medication.

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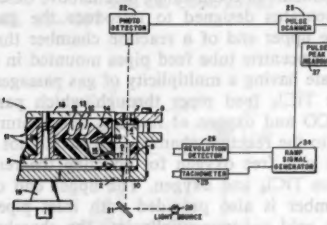
**3,586,484**
**MULTISTATION ANALYTICAL PHOTOMETER AND METHOD OF USE**

**Norman G. Anderson, Oak Ridge, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission**

**Filed May 23, 1969, Ser. No. 827,185**
**Int. Cl. G01n *1/10, 21/00, 33/16*; B04b *5/12***
**U.S. Cl. 23—230** **6 Claims**

An analytical photometer wherein precipitates are removed from a multiplicity of discrete samples by cen-

trifugation prior to transfer of the samples to respective cuvettes in a rotary cuvette system for photomeric measurement. A central transfer disc is provided with a first series of chambers which separately retain precipitating solutions while at rest, and release the solutions to respective sedimentation chambers upon rotation. A third series of chambers receives the supernatant from respective sedimentation chambers by gravity flow when the transfer




disc and cuvette system are brought to rest. The supernatant may then be transferred centrifugally to respective cuvettes in the rotary cuvette system surrounding the transfer disc. A light source and detector are aligned with transparent windows in the cuvettes to determine chemical species concentrations by light absorbancy in the samples contained in the cuvettes. Means are provided for receiving the output of the detector and individually indicating the phototransmittance of samples within the cuvettes.

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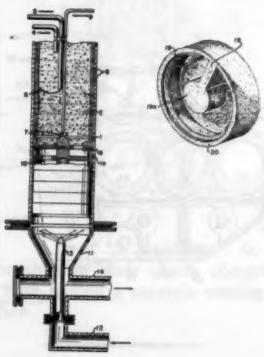
**3,586,485**
**REACTOR PACKING**

**Hugh J. Hagemeyer, Jr., Max Statman, and Herschel T. Vinyard, Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Original application Feb. 25, 1966, Ser. No. 530,023, now Patent No. 3,442,933, dated May 6, 1969. Divided and this application Dec. 19, 1968, Ser. No. 785,119**
**Int. Cl. C01b *31/36;* B01j *9/02***
**U.S. Cl. 23—252** **1 Claim**

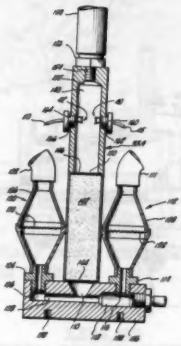


Silicon carbide packing elements which have been pretreated with nitric acid improve reactor heat transfer and reduce carbonization in chemical processes, particularly in oxidative dehydrogenation processes for the production of unsaturated organic compounds such as styrene and methyl methacrylate.

**3,586,486**
**GAS ANALYZER**

**Young Ho Kim, Santa Clara County, Calif., and John N. Pattison, Hamilton County, Ohio, assignors to American Bosch Arma Corporation, Garden City, N.Y.**

**Filed Feb. 23, 1968, Ser. No. 707,814**
**Int. Cl. G01n *25/32, 31/10;* H01c *7/04***
**U.S. Cl. 23—254** **13 Claims**



A catalytic combustion type gas analyzer which mixes gas and air in a selected ratio. The mixture is passed over a pair of electrically heated resistance elements, only one of which is catalytically active, connected in a Wheatstone bridge measuring circuit. Any combustible gas in the sample is oxidized at the catalytic surface of the active element, producing an element temperature rise proportional to the percentage of combustible gas, thereby unbalancing the Wheatstone bridge. The elements utilize a ceramically coated electrical conductor, over which a glass seal is formed. An aluminum or beryllium oxide coating covers the glass seal. The catalytically active element has a catalytic coating over the oxide coating.

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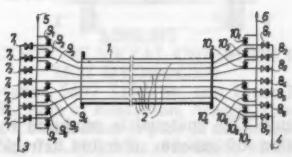
**3,586,487**
**APPARATUS FOR CONTINUOUSLY DIGESTING ALUMINA**

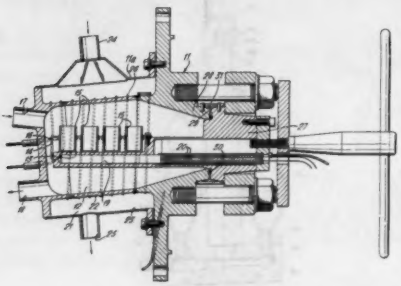
**Adam Juhasz, Laszlo Mahig, Albert Nagy, Gyorgy Sigmond, and Janos Steiner, Budapest, Hungary, assignors to Aluters Aluminiumipari Tervezo Intezet, Budapest, Hungary**

**Filed Apr. 21, 1969, Ser. No. 817,734**
**Claims priority, application Hungary, Apr. 26, 1968, AU-196**
**Int. Cl. B01d *11/00***
**U.S. Cl. 23—267** **4 Claims**



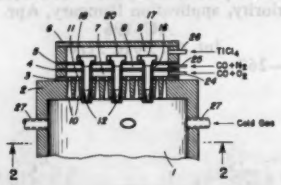
Alumina is digested by the Bayer process in the tube side of a tube-and-shell heat exchanger heated by steam flashed from the digested slurry. A plurality of separate shells are arranged end-to-end with tube sheets between them and with the tubes extending through them in series. Each tube is separately valved for simultaneous washing of selected tubes while the other tubes are on stream.

3,586,488
SAMPLING DEVICES
Peter Asquith Trevalion, Helsby, and Ronald Swinhoe, Culcheth, England, assignors to United Kingdom Atomic Energy Authority, London, England
Filed May 19, 1967, Ser. No. 639,784
Claims priority, application Great Britain, May 24, 1966, 23,190/66
Int. Cl. B01d 1/00; G01n 1/00
U.S. Cl. 23—273 3 Claims



A sampling apparatus by which a non-volatile solute may be obtained from a solution of the solute dissolved in a volatile solvent. A sample of solution passed through the apparatus is retained in a demountable crucible having a heater to volatilise solution in the crucible while an adjacent surface is cooled to condense volatile material evolved from the crucible. After heating, the crucible containing the impurities can be removed, and the adjacent surface (which is provided with a separate heater) warmed through to melt material condensed thereon.

3,586,489
DEVICE FOR THE MANUFACTURE OF FINE PARTICLE SIZE TITANIUM DIOXIDE
Giovanni Hilgers, Hau, Post Bechen, Gerhard Hitzemann, Giershofen, Post Dierdorf, and Achim Kulling, Opladen, Germany, assignors to Titangesellschaft mbH, Leverkusen, Germany
Filed Aug. 29, 1968, Ser. No. 756,107
Int. Cl. C01g 23/04
U.S. Cl. 23—277 10 Claims

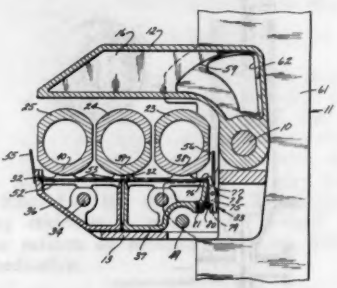



A pyrogenic $TiO_2$ material is produced by the vapor phase reaction of gaseous titanium tetrachloride with oxygen in the presence of hot combustion gases produced by combustion of carbon monoxide and oxygen wherein all of the oxygen required for the reaction is introduced in admixture with carbon monoxide, the gaseous $TiCl_4$ being introduced into the reaction chamber as one or more rotating jet streams each surrounded by a mantle of gaseous carbon monoxide which reacts with the surrounding hot combustion gases plus free oxygen to produce a spatially fixed circular flame at a predetermined distance below the point of introduction of each rotating stream of gaseous $TiCl_4$ as a consequence of which the reaction of the gaseous $TiCl_4$ and free oxygen always takes place at substantially the same location i.e. reaction zone in the reaction chamber and owing to the rotary movement of each $TiCl_4$ jet stream the reaction zone is relatively short as a consequence of which the residence time of the $TiO_2$ particles formed therein is short and of substantially equal duration thereby producing a uniform fine-grained product. The means used for reacting the gaseous components in the manner hereinabove described comprises apparatus designed to introduce the gaseous $TiCl_4$ into the upper end of a reaction chamber through one or more concentric tube feed pipes mounted in a gas permeable plate having a multiplicity of gas passages surrounding the $TiCl_4$ feed pipes through which passages mixtures of CO and oxygen at reacting temperature are introduced into the reaction chamber to provide hot combustion gases plus free oxygen for effecting the reaction of the gaseous $TiCl_4$ and oxygen. The upper end of the reaction chamber is also provided with inlet pipes for introducing a cold gas tangentially into the chamber for sweeping the walls free of $TiO_2$ deposits.

3,586,490
GELLED HYDROCARBON COMPOSITIONS
Gerhart Karg, Pompton Lakes, N.J., assignor to Witco Chemical Company, Inc., New York, N.Y.
No Drawing. Filed Mar. 21, 1968, Ser. No. 714,800
Int. Cl. C10l 7/00
U.S. Cl. 44—7 13 Claims

Liquid aliphatic hydrocarbons are converted into stable gels by the addition of a liquid gelling agent composed of small proportions of water, an aliphatic polyhydric alcohol and an alkanolamine salt of a phosphoric acid ester of ethoxylated linear or branched chain aliphatic alcohols.

3,586,491
MOLD COOLING APPARATUS FOR GLASS FORMING MACHINE
Joseph L. Mennitt, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Apr. 23, 1969, Ser. No. 818,606
Int. Cl. C03b 9/14, 9/38
U.S. Cl. 65—265 9 Claims



The supporting and cooling of blow molds on a glass forming machine in which cooling air is introduced into the chambers of hollow blow mold arms with the air being directed against the backs of plural mold halves. The mold halves are physically mounted on hollow holders with interchangeable cooling plates interposed the hollow holder and the backs of the molds so as to distribute the air in a selected pattern. The air, as it is

introduced into the mold arms, is controlled by the setting of baffle plates, with the air moving from the arms into the mold holders.

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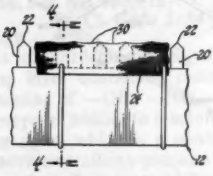
**3,586,492**
**GLASS SHEET SUPPORT FOR A PRESS SHAPING APPARATUS**
**Harold A. McMaster, Woodville, Ohio, assignor to Permaglass, Inc., Millbury, Ohio**
**Filed Nov. 4, 1968, Ser. No. 773,175**
**Int. Cl. C03b *23/02***
**U.S. Cl. 65—287** **4 Claims**



A method and apparatus for treating a heated sheet of glass by supporting the sheet with an endless ring frame having teeth with elongated points thereon by contacting one face or surface of the sheet adjacent the periphery with the points of the teeth. In the preferred embodiment, a wire mesh screen is disposed over the elongated points for contacting the sheet.

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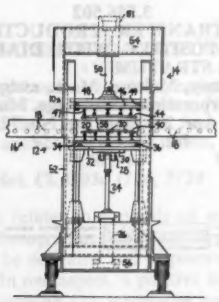
**3,586,493**
**MOLD FOR BENDING GLASS SHEETS**
**George R. Claassen, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**
**Filed Oct. 23, 1968, Ser. No. 769,985**
**Int. Cl. C03b *23/02***
**U.S. Cl. 65—291** **10 Claims**



A mold for shaping glass sheets comprising a contoured metal base having a ceramic coating on its glass engaging surface.

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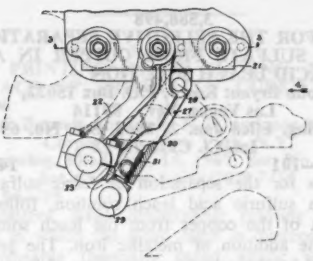
**3,586,494**
**BAFFLE MOVING AND ALIGNMENT MEANS**
**Eustace H. Mumford, Ottawa Lake, Mich., assignor to Owens-Illinois Inc.**
**Filed Jan. 9, 1969, Ser. No. 790,005**
**Int. Cl. C03b *9/40***
**U.S. Cl. 65—323** **5 Claims**

A glass forming machine wherein a plurality of charges of glass are delivered to a plurality of parison mold cavities and are formed into parisons after which the parisons are inverted and delivered to a blow mold at another station for forming the final article. Means



are provided for moving the baffles vertically and horizontally substantially equal distances from their respective parison mold cavities.

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**3,586,495**
**PRODUCTION OF NITROGENOUS AND PHOSPHATE FERTILIZERS**
**Robert Bauwens and Roland Julou, Colombes, France, assignors to Societe Anonyme Ugine Kuhlmann, Paris, France**
**No Drawing. Filed May 15, 1968, Ser. No. 729,367**
**Claims priority, application France, May 22, 1967, 107,296**
**Int. Cl. C05b *15/00***
**U.S. Cl. 71—29** **6 Claims**

A process for producing a nitrogen-phosphate fertilizer wherein the available amount of phosphoric anhydride $P_2O_5$ is totally water-soluble and is, therefore, suitable for the manufacture of liquid fertilizers. Wet phosphoric is defluosilicated, ammoniated and treated with urea to produce the nitrogen-phosphate fertilizer.

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**3,586,496**
**HERBICIDAL COMPOSITIONS AND USE OF N-(CYCLOALKEN - 1 - YL-) ALPHA-HALO-ACETAMIDES**
**John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.**
**No Drawing. Continuation-in-part of application Ser. No. 523,870, Feb. 1, 1966. This application Sept. 15, 1969, Ser. No. 858,140**
**Int. Cl. A01n *9/20, 9/02***
**U.S. Cl. 71—118** **29 Claims**

Herbicidal compositions and method of use utilizing N-(cycloalken-1-yl)-alpha-haloacetamides.

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**3,586,497**
**REDUCTION OF METAL CHLORIDE WITH HOT HYDROGEN**
**Percival Gravenor, 5807 115th St., and Tyson Rigg, 4124 121st St., both of Edmonton, Alberta, Canada**
**No Drawing. Continuation-in-part of abandoned application Ser. No. 712,302, Mar. 11, 1968, which is a continuation-in-part of abandoned application Ser. No. 406,519, Oct. 26, 1964. This application June 18, 1968, Ser. No. 737,844**
**Int. Cl. C21b *15/00*; C22b *23/02***
**U.S. Cl. 75—34** **7 Claims**

In a method for reducing ferrous, nickel or cobalt chloride to the metal state, the chloride crystals are first formed into curviformed briquets. Beds of these briquets are reduced in a reactor using not hydrogen pre-heated to a temperature well above the melting temperature of the

chloride. The hydrogen provides all the heat requirements for raising the briquets to reduction temperature and reducing them. In an optional feature, iron oxide may be admixed with the ferrous chloride prior to briqueting.

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**3,586,498**

**PROCESS FOR THE SELECTIVE SEPARATION OF FERRIC SULFATE FROM COPPER IN A SULFURIC ACID LEACH SOLUTION**

**John Bryant Kasey, P.O. Box 15022, Las Vegas, Nev. 89114**

**No Drawing. Filed Jan. 2, 1968, Ser. No. 694,869**
**Int. Cl. C22b *15/12***
**U.S. Cl. 75—101** **14 Claims**

A process for the separation of ferric sulfate from copper in a sulfuric acid leach solution, followed by precipitation of the copper from the leach solution by means of the addition of metallic iron. The process is characterized by the selective separation of ferric sulfate from copper in the sulfuric acid leach solution, prior to precipitation of the copper, by the addition of a carbonate salt. The process minimizes the metallic iron requirement and is useful in the hydrometallurgical recovery of copper from copper containing ores and materials.

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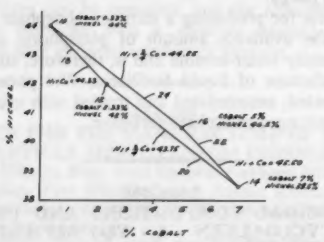
**3,586,499**

**SEALING ALLOY**

**Arnold J. Gottlieb, Colonia, and George A. Majesko, Glen Ridge, N.J., assignors to Wilbur B. Driver Company**

**Filed June 17, 1968, Ser. No. 737,606**
**Int. Cl. C22c *39/10***
**U.S. Cl. 75—123K** **5 Claims**




An alloy used in metal to glass seals and the like containing as primary constituents, nickel, cobalt, and iron. In this alloy, the cobalt content falls within the range 0.33%–7% by weight, the nickel content falls within the range 38.5%–44%, the sum of the nickel plus cobalt content falls within the range 44.33%–45.5% and the sum of the nickel plus 75% of the cobalt content falls within the range 43.75%–44.25%.

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**3,586,500**

**ELECTROPHOTOGRAPHIC COMPOSITION AND ELEMENT**

**Lawrence E. Contois, Webster, and Donald P. Specht, Spencerport, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**No Drawing. Filed Nov. 1, 1968, Ser. No. 772,863**
**Int. Cl. G03g *5/06***
**U.S. Cl. 96—1.6** **11 Claims**

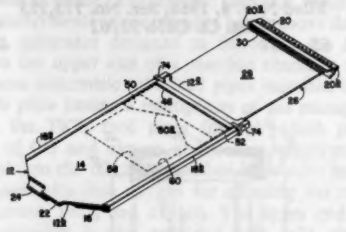
Pyrylium, benzc(b)pyrylium and benzo(b)thiapyrylium salts can be used as infrared sensitizers for photoconductors. These salts interact with certain organic photoconductors, such as arylamine-containing compounds, to extend the spectral sensitivity of the photoconductor into the far red and near infrared region of the spectrum.

**3,586,501**

**PHOTOGRAPHIC FILM UNIT**

**Warren E. Norquist, Weston, Eugene F. Marckini, Lexington, and Paul J. Vitali, Sharon, Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed Feb. 12, 1968, Ser. No. 704,816**
**Int. Cl. G03c *1/48*; G03d *9/02***
**U.S. Cl. 96—29** **19 Claims**



A photographic film unit of the self-developing type including a pair of superposed sheets having generally rectangular sections provided with tabs at one end thereof. A separable seal extends across the sheets inwardly of the tabs and they are releasably connected together along their juxtaposed edges extending on the opposite side of the seal from the tabs. The film unit further includes an image-receiving sheet, a rupturable container of processing fluid, a mask and rails, positioned inside the envelope formed by the attached superposed sheets, and a photosensitive sheet adapted to be selectively inserted into and removed from the envelope through its opened end. Tapes connecting superposed sheets, adjacent the opening provided between same serves to retain them in hinged relationship when the aforesaid seal and connections are broken. The mask is firmly attached to one of the superposed sheets and overlaps a portion of the image-receiving sheet.

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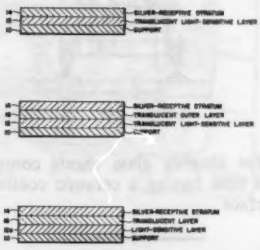
**3,586,502**

**DIFFUSION TRANSFER PRODUCTION OF REFLECTION POSITIVE WITH DIALDEHYDE IN RECEPTIVE STRATUM**

**Leonard C. Farney, Melrose, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Apr. 22, 1968, Ser. No. 723,004**
**Int. Cl. G03c *5/54***
**U.S. Cl. 96—29** **9 Claims**



Photographic products for forming a composite print viewable as a positive silver image, including a silver halide emulsion layer, an opacifying material in the emulsion layer and/or in an overlying layer, and an outer layer comprising a silver-receptive stratum, wherein the silver-receptive stratum includes a reagent which upon

application of an aqueous alkaline processing liquid will effect a hardening of the silver-receptive stratum at some time during or after image formation but which will not adversely retard to any noticeable extent the absorption rate of this liquid through the stratum.

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3,586,503

## HARDENING AGENTS FOR IMAGE-RECEIVING ELEMENTS

Lloyd D. Taylor, Everett, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

No Drawing. Continuation-in-part of abandoned application Ser. No. 229,194, Oct. 8, 1962. This application Dec. 30, 1966, Ser. No. 605,971

Int. Cl. G03c *5/54*

U.S. Cl. 96—29 7 Claims

The process of hardening a polymeric photographic image-receiving layer containing radicals selected from the group consisting of —OH, —$NH_2$ and —SH radicals, including the steps of adding to a solution of the polymer a cross linking agent which is a condensate of acrolein and either a tetraloweralkoxy-propane or a lower alkyl-monoaldehyde other than formaldehyde, and thereafter casting and drying a layer of the solution.

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3,586,504

## PHOTORESIST DEVELOPERS AND METHODS

Alfred E. Coates and Bertalan J. Vegh, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 24, 1969, Ser. No. 869,331

Int. Cl. G03c *5/00*

U.S. Cl. 96—35.1 10 Claims

Alkylphenoxy poly(hydroxyalkylene oxide), e.g., p-nonylphenoxy polyglycidol, are included in aqueous alkali solutions which are used in methods for developing photoresist compositions which on exposure to light image are converted in exposed areas from aqueous alkali insoluble to aqueous alkali soluble.

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3,586,505

## SENSITIZING SILVER HALIDE EMULSION LAYERS

Michael Ridgway, London, England, assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 14, 1966, Ser. No. 601,534

Claims priority, application Great Britain, Dec. 16, 1965, 53,382/65

Int. Cl. G03c *1/28, 5/24*

U.S. Cl. 96—64 9 Claims

This invention relates to methods of sensitizing silver halide layers, photographic elements comprising sensitizers which can be activated and to processes of forming positive images. In one aspect, a positive image is formed in a process comprising (1) imagewise exposing a silver halide layer comprising an internal image emulsion, (2) surface-sensitizing the internal image emulsion, (3) flash exposure of the layer and (4) developing the silver halide layer.

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3,586,506

## DEVELOPING AGENT PRECURSORS OF CYCLOHEX-2-ENE-1,4-DIONES

Derek D. Chapman, John W. Gates, Jr., and Walter J. Musliner, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Mar. 27, 1968, Ser. No. 716,325

Int. Cl. G03c *1/76*

U.S. Cl. 96—66 19 Claims

Photographic developing agent precursors, useful for example, for incorporation in photographic elements, are provided in the form of cyclohex-2-ene-1,4-diones and monoketals thereof. These can be prepared from corresponding 5,8-methano - 2,3,4a,5,8,8a - hexahydro - 1,4-naphthoquinones or corresponding monoketals by pyrolytic decomposition.

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3,586,507

## DIAZO PRINTING PLATE HAVING PRINTING SURFACE OF THERMALLY CURED ALLYLIC RESIN

Leo S. Burnett, Scarsdale, N.Y., assignor to FMC Corporation, New York, N.Y.

No Drawing. Filed Dec. 14, 1967, Ser. No. 690,408

Int. Cl. B41m *1/06;* G03f *7/10*

U.S. Cl. 96—75 5 Claims

Presensitized diazo lithographic printing plates are prepared in which the diazo layer is overcoated with a light permeable thermally cured allylic resin. After exposure and developing in essentially the usual manner, the resin coating becomes detached or otherwise removed over those areas dissolved out by the processing solution. The resulting plate contains image areas of cured allylic resin bonded to the remaining insoluble diazo image. After gumming and inking, the plate is ready for printing.

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3,586,508

## TETRAPOLYMER SUBBED PHOTOGRAPHIC FILM

William Frank Fowler, Jr., and Gerhard Klose, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 30, 1967, Ser. No. 686,833

Int. Cl. G03c *1/80*

U.S. Cl. 96—87 6 Claims

The disadvantages encountered in the use of subbing or u-coat compositions comprising relatively large proportions (above 35%) of vinylidene chloride are overcome by the use of a haloalkyl acrylate, vinylidene chloride, alkyl acrylate, or methacrylate, and itaconic acid tetrapolymer which provides excellent adhesion while permitting a reduction of the vinylidene chloride content of the subbing composition to substantially below 35% (i.e., below about 25%).

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3,586,509

## LIPPMANN PHOTOGRAPHIC EMULSION WITH A NON-SENSITIZING DYE

Robert E. Kerwin, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

No Drawing. Filed Sept. 17, 1968, Ser. No. 760,357

Int. Cl. G03c *1/10*

U.S. Cl. 96—99 4 Claims

High resolution silver halide photographic emulsions containing a dye capable of absorbing radiation in the visible region of the spectrum have been found to limit effective exposure regions in the emulsion to the depth of focus of the optics employed and minimize fogging due to diffracted or scattered light.

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3,586,510

## HELICAL PUMP SYSTEM AND USE IN PROCESSING OF FOODS

Daniel Frederick Farkas, Berkeley, and William C. Rockwell, El Cerrito, Calif., assignors to the United States of America as represented by the Secretary of Agriculture

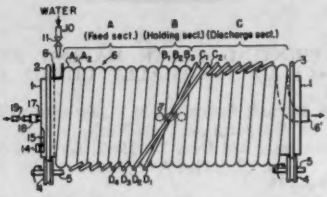
Filed June 13, 1969, Ser. No. 833,110

Int. Cl. A23l *1/00*

U.S. Cl. 99—1 14 Claims

Device for treating materials—e.g., fruits, vegetables, grains, packaged foods, etc.—at pressures above or below

atmospheric pressure, which includes a helical pumping system for conveying the material into and out of the treatment zone whereby the integrity of the material is preserved, even where it is of a delicate nature as is the




case, for example, with berries, peach halves, foods packaged in plastic pouches, etc. A special feature of the helical pump is the provision of an air feedback arrangement for increasing pumping efficiency and for avoiding instability during operation.

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**3,586,511**

## METHOD OF MAKING SACCHARIFEROUS ANIMAL FEED AND THE RESULTING PRODUCT

**Ralph W. Bishop, 312 N. Atlantic St., Clewiston, Fla. 33440**

**No Drawing. Filed July 1, 1966, Ser. No. 562,073**
**Int. Cl. A23k *1/14***
**U.S. Cl. 99—2** **8 Claims**

A method of producing a pelletized sacchariferous animal feed from sugar cane by controlled burning standing sugar cane in the field to burn off the dead relatively dry leaves and simultaneously decrease the moisture content of the remaining stalk without effecting significant charring thereof, followed by harvesting and comminution of the cane after which it is dried to a low moisture content and pelletized.

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**3,586,512**

## IMPARTING FRIED APPEARANCE TO BAKED FOODSTUFFS

**John J. Mancuso, Astoria, and Betty F. Hagen, Irvington, N.Y., assignors to General Foods Corporation, White Plains, N.Y.**

**No Drawing. Continuation-in-part of application Ser. No. 489,388, Sept. 22, 1965. This application Aug. 18, 1969, Ser. No. 851,060**
**Int. Cl. A23l *1/12*; A23b *1/00, 7/00***
**U.S. Cl. 99—100** **11 Claims**

A composition of water-soluble food dye, edible fat and farinaceous material for coating foods prior to baking. Through the reaction from the baking heat and the concomitant moisture vapor from the food, the composition develops into an appealing coating having the appearance, odor, texture and color equivalent to that of ordinary coatings applied to foods which are deep fat fried.

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**3,586,513**

## AERATED CONFECTIONS CONTAINING 5–15 D.E. STARCH HYDROLYZATE

**Harold Edwin Horn, Oak Lawn, Edward Richard Jensen, Hinsdale, and Bruce Alan Kimball, Chicago, Ill., assignors to CPC International Inc.**

**No Drawing. Filed Oct. 21, 1968, Ser. No. 769,425**
**Int. Cl. A23g *3/00***
**U.S. Cl. 99—134** **13 Claims**

By replacing up to 70% of the protein whipping agent in a confection composition with a low D.E. starch hydrolysate having a D.E. of about 5 to about 25, whipped confections may be more quickly and economically produced.

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**3,586,514**

## THIN-WALLED PLASTIC CONTAINER FOR BEER

**Taco Vijlbrief, Rotterdam, Netherlands, assignor to Heineken Technisch Beheer N.V., Amsterdam, Netherlands**

**No Drawing. Continuation-in-part of application Ser. No. 640,479, May 23, 1967. This application May 28, 1969, Ser. No. 828,697**
**Claims priority, application Netherlands, May 27, 1966, 6607458**
**Int. Cl. B65b *3/00*; C08f *45/58***
**U.S. Cl. 99—171** **3 Claims**

A thin-walled container for beer and the like, having reduced oxygen permeability, is made of hard polyvinyl chloride which contains an antioxidant.

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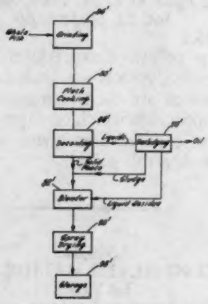
**3,586,515**

## METHOD AND APPARATUS FOR CONVERTING BODIES INTO PARTICULATE MATTER

**Eldon E. Anderson, Los Angeles, Calif., assignor to Marine Technology, Inc.**

**Filed Oct. 22, 1968, Ser. No. 769,509**
**Int. Cl. A23b *3/04***
**U.S. Cl. 99—209** **9 Claims**



Apparatus and process for the conversion of whole fish into fish meal and oil by grinding the whole fish to form a slurry; flash heating the ground fish to a temperature under its boiling point; holding the slurry for a time; centrifugally separating the slurry into a solid phase and a liquid phase; centrifugally separating the liquid phase into oil and a liquid residue; removing the oil; combining the liquid residue with the solid phase; and spray drying the combined material with a pulse jet engine to form fish meal particles.

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**3,586,516**

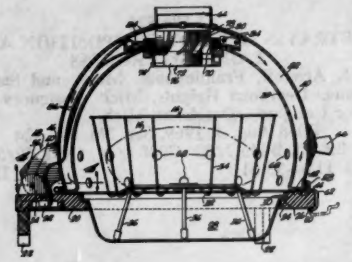
## MEAT DEFROSTING APPARATUS

**Nemen M. Terc, Coral Gables, Fla., assignor to Fred C. Smith, Nassau, N.P. Bahamas, and John S. Joannou, Portsmouth, Anthony P. Kolantis, Norfolk, and Nicholas H. Themides, Virginia Beach, Va., fractional part interest to each**

**Filed Apr. 18, 1969, Ser. No. 817,354**
**Int. Cl. A23b *1/06***
**U.S. Cl. 99—234T** **4 Claims**

Apparatus for defrosting frozen foods and particularly meats in which a closed receptacle includes an open, elevated-basket enclosed beneath a double-walled dome

forming a plenum in which air outlets are circumferentially disposed about the basket and air is expressed toward the basket and is exhausted axially above the basket in a continuous path of movement while being



heated whereby frozen meats and the like are maintained in a substantially moist condition, natural flavor is retained, defrosting is accelerated, and the exposure to active bacteria in the air is maintained at a minimum while the meat is being defrosted.

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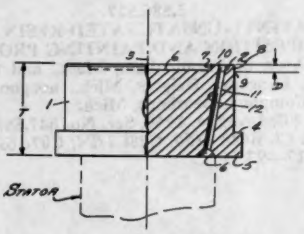
**3,586,517**
**EXTRUDER DIE**
**Robert W. La Warre, Lima, Ohio, and Robert H. Bundus, Riverside, Ill., assignors to Beatrice Foods Co., Chicago, Ill.**
**Filed Apr. 1, 1969, Ser. No. 811,837**
**Int. Cl. B30b *11/22***
**U.S. Cl. 99—238** **5 Claims**



There is provided a die plate, especially for extruding cereal meals, which has a plurality of outwardly inclined bores therethrough, with respect to the center line of the die plate. A recessed face is circumscribed by the discharge of the bores and receives a blast of cooling air. The extrudant is uniformly shaped and not burned.

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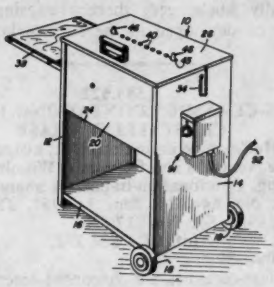
**3,586,518**
**ELECTRIC BARBECUE MACHINE**
**Earl T. Folmar, Goshen, Ala.**
**(Rte. 3, Troy, Ala. 36081)**
**Filed Apr. 1, 1969, Ser. No. 812,150**
**Int. Cl. A23b *1/04***
**U.S. Cl. 99—259** **4 Claims**

A portable barbecue machine having a heater assembly including a heater element positioned below a grill upon which food is placed to be cooked. An inverted angle iron is placed in vertical alignment over the heating element so that drippings are deflected away from the element. A tray may be positioned beneath the angle iron and immediately above the heating element, the tray allowing insertion of smoking materials such as charcoal, hickory or the like therein. The angle iron includes a slitted apex portion so that the smoke may pass therethrough to



treat the food. A drippings deflector is placed over the slit in overlying spaced relation so that drippings are prevented from falling through the slit into the tray.

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**3,586,519**
**CORROSION INHIBITING BUTADIENE STYRENE PAINT COMPOSITION**
**John J. Hendricks, Flushing, N.Y., assignor to Sapolin Paints, Inc., New York, N.Y.**
**No Drawing. Filed June 6, 1969, Ser. No. 831,222**
**Int. Cl. C09d *5/08***
**U.S. Cl. 106—14** **2 Claims**

Coating compositions, suitable for providing anti-corrosion coatings on metal surfaces and particularly for application to rusty and weathered surfaces comprising a water based latex metal primer containing an additive mixture of di-basic ammonium citrate and a neutralized acidic phosphate co-ester of an aliphatic alcohol and a non-ionic adduct of ethylene oxide and an organic compound containing reactive hydrogen atoms.

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**3,586,520**
**REGENERATED CELLULOSE SPONGE RESISTANT TO PIGMENT BLEEDING AND FUNGICIDAL DEGRADATION AND PROCESS**
**Harold L. Dillon, Columbia, Tenn., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**
**No Drawing. Continuation-in-part of application Ser. No. 619,155, Feb. 28, 1967. This application Mar. 28, 1969, Ser. No. 811,679**
**Int. Cl. C08b *27/74***
**U.S. Cl. 106—15** **8 Claims**

Regenerated cellulose sponges are immersed in a dispersion of a fungicidally active metal salt of dialkyl dithiocarbamic acid in water and then dried. A preferred embodiment uses a small amount of a zinc salt of 2-mercaptobenzothiazole in the dispersion. This treatment not only produces protection from fungicidal attack, but also reduces the tendency of the color pigment to leach out of the sponge when immersed in water.

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**3,586,521**
**GLASS-CERAMIC ARTICLE AND METHOD**
**David A. Duke, 7 Theresa Drive, Corning, N.Y. 14830**
**No Drawing. Continuation-in-part of application Ser. No. 365,202, May 5, 1964. This application Mar. 18, 1968, Ser. No. 714,014**
**Int. Cl. C03c *3/22***
**U.S. Cl. 106—39** **5 Claims**

This invention relates to the strengthening of glass-ceramic articles wherein the crystal content thereof constitutes the predominant portion and containing carnegieite

as the principal crystal phase. The strengthening effect is realized through an ion exchange reaction occurring within a surface layer of the article wherein potassium ions from an external source are exchanged for sodium ions in the carnegieite crystals but the structural nature of the crystals is essentially unchanged, thereby causing compressive stresses to be developed in the surface layer.

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**3,586,522**
**GLASS-CERAMICS CONTAINING $BaAl_2Si_2O_8$ CRYSTALLINE PHASE**

**Lewis C. Hoffman, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 646,414, June 1, 1967. This application Mar. 29, 1968, Ser. No. 717,410**
**Int. Cl. C03c *3/22***
**U.S. Cl. 106—39** **4 Claims**

Novel glass-ceramics which consist essentially of critical proportionate amounts of $SiO_2$, PbO, $Al_2O_3$, $TiO_2$ and BaO; optional components include: ZnO, $PbF_2$, SrO, $ZrO_2$, $Ta_2O_5$, $WO_3$, CdO, $SnO_2$ and $Sb_2O_3$. These glass-ceramics are usable, e.g., in particulate form, in preparing screen printable crossover dielectric compositions, and as the inorganic binder component in preparing screen printable conductor compositions and resistor compositions.

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**3,586,523**
**CALCINED KAOLIN CLAY PIGMENT**

**John R. Fanselow, Plainfield, and Daniel A. Jacobs, Metuchen, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Township of Woodbridge, N.J.**

**No Drawing. Filed Jan. 15, 1968, Ser. No. 697,581**
**Int. Cl. C08h *17/06*; C09c *1/42***
**U.S. Cl. 106—288B** **2 Claims**

A finely divided, substantially anhydrous amorphous aluminum silicate obtained by calcining a specific type of kaolin clay, namely hard sedimentary kaolin clay, is used as a functional filler for newsprint or similar lightweight printed paper that is printed with low viscosity ink to reduce ink strike-through and to increase sheet brightness and opacity.

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**3,586,524**
**CONSOLIDATION OF FORMATIONS BY ELECTROLESS METAL PLATING PROCESS**

**Edwin A. Richardson, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.**

**No Drawing. Filed July 10, 1969, Ser. No. 840,826**
**Int. Cl. C23c *3/02*; E21b *33/138***
**U.S. Cl. 166—292** **7 Claims**

The method of consolidating incompetent formations at low temperatures in the presence of an electroless basic metal plating solution under conditions of reduced stress by addition to the solution of a small amount of an organic sulfimide.

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**3,586,525**
**METHOD OF MANUFACTURING SYNTHETIC LEATHER**

**Ichiro Minobe and Takashi Suzuki, Osaka, Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 559,334, June 21, 1966. This application Sept. 11, 1969, Ser. No. 857,235**
**Claims priority, application Japan, July 6, 1965, 40/40,740**
**Int. Cl. B44d *1/44*; D06n *3/00***
**U.S. Cl. 117—63** **8 Claims**

Process for preparing synthetic leather by coating a fibrous substrate with a composition consisting of polyurethane-urea polymer solution, an inorganic compound such as light calcium carbonate, magnesium carbonate, fine particle clay, hydrous silicate and zinc oxide having a particle size of 40 mμ–2μ as nuclei ingredient and from 2–6% by weight based on the polymer solvent of a liquid miscible with the polymer solvent but incapable of dissolving the polymer, coagulating the polymer and extracting the solvent from the resultant product.

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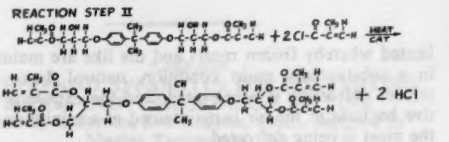
**3,586,526**
**TETRAVINYL PAINT COMPOSITION AND PAINTING PROCESS**

**Elihu J. Aronoff, Framingham, Mass., and Santokh S. Labana, Dearborn Heights, Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Aug. 4, 1969, Ser. No. 847,324**
**Int. Cl. B44d *1/50*; C08f *1/24*; C07c *69/52***
**U.S. Cl. 117—93.31** **15 Claims**




A substrate is coated with a film-forming composition comprising unique tetravinyl compound and the coating is converted to a tenaciously adhering, solvent-resistant, wear-and-weather-resistant coating by exposing the coated substrate to ionizing radiation, preferably in the form of an electron beam. This tetravinyl compound is formed by first reacting a diepoxide with acrylic acid and/or methacrylic acid and subsequently reacting the resultant ester condensation product with a vinyl unsaturated acyl halide.

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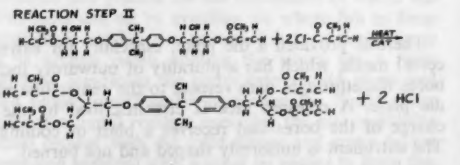
**3,586,527**
**TETRAVINYL-UNSATURATED RESIN PAINT COMPOSITION AND PAINTING PROCESS**

**Elihu J. Aronoff, Framingham, Mass., and Santokh S. Labana, Dearborn Heights, Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Aug. 4, 1969, Ser. No. 847,588**
**Int. Cl. B44d *1/50*; C08f *1/24*; C07c *69/52***
**U.S. Cl. 117—93.31** **28 Claims**



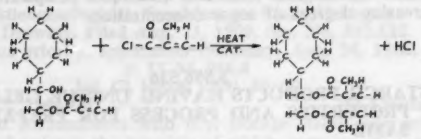

A substrate is coated with a film-forming composition consisting essentially of a unique tetravinyl compound having a molecular weight below about 350, preferably in the range of about 220 to about 1,100, and an alpha-beta olefinically unsaturated paint binder resin having a molecular weight in excess of about 1,000, preferably in the range of about 2,000 to about 20,000, is converted into a tenaciously adhering, solvent-resistant, wear and weather-resistant coating by exposing the coated substrate to ionizing radiation, preferably in the form of an electron beam. This tetravinyl compound is formed by first reacting a diepoxide with acrylic acid and/or methacrylic acid and subsequently reacting the resultant ester condensation product with a vinyl unsaturated acyl halide.

3,586,528

## DIVINYL-RESIN PAINTS AND PAINTING PROCESS

Santokh S. Labana, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 4, 1969, Ser. No. 847,592
Int. Cl. B44d 1/50; C08f 1/24; C07c 69/52
U.S. Cl. 117—93.31 32 Claims



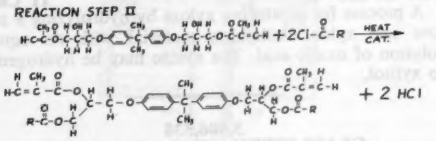
A substrate is coated with a film-forming composition consisting essentially of a unique divinyl compound and an alpha-beta olefinically unsaturated paint binder resin having a molecular weight in excess of about 1,000, preferably in the range of about 2,000 to about 20,000 and the coating is converted into a tenaciously adhering, solvent-resistant, wear and weather-resistant coating by exposing the coated substrate to ionizing radiation, preferably in the form of an electron beam. This divinyl compound is formed by first reacting a monoepoxide with acrylic acid and/or methacrylic acid and subsequently reacting the resultant monovinyl ester condensation product with a vinyl unsaturated acyl halide.

3,586,529

## DIVINYL PAINT COMPOSITION AND PAINTING PROCESS

Elihu J. Aronoff, Framingham, Mass., and Santokh S. Labna, Dearborn Heights, and Ernest O. McLaughlin, Garden City, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 4, 1969, Ser. No. 847,288
Int. Cl. B44d 1/50; C07c 69/52; C08f 1/24
U.S. Cl. 117—93.31 22 Claims



A substrate is coated with a film-forming composition comprising a unique divinyl compound and the coating is converted to a tenaciously adhering, solvent-resistant, wear and weather-resistant, preferably in the form of an electron beam. This divinyl compound is formed by first reacting a diepoxide with acrylic acid and/or methacrylic acid and subsequently reacting the resultant ester condensation product with a saturated acyl halide.

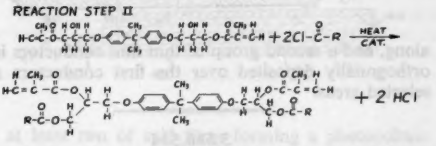
3,586,530

## DIVINYL COMPOUND-UNSATURATED RESIN PAINT COMPOSITION AND PAINTING PROCESS

Elihu J. Aronoff, Framingham, Mass., and Santokh S. Labana, Dearborn Heights, and Ernest O. McLaughlin, Garden City, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 4, 1969, Ser. No. 847,232
Int. Cl. B44d 1/50; C07c 69/52; C08f 1/24
U.S. Cl. 117—93.31 33 Claims

A substrate is coated with a film-forming composition consisting essentially of a unique divinyl compound having a molecular weight below about 2,600, preferably in the range of about 220 to about 1,100, and an alpha-beta olefinically unsaturated paint binder resin having a molecular weight in excess of about 1,000, preferably in the range of about 2,000 to about 20,000, is converted into a tenaciously adhering solvent-resistant, wear and weather-resistant coating by exposing the coated substrate to ionizing radiation, preferably in the form of an electron beam.



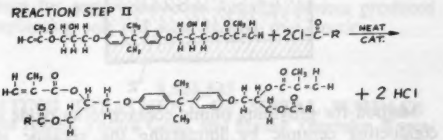
This divinyl compound is formed by first reacting a diepoxide with acrylic acid and/or methacrylic acid and subsequently reacting the resultant ester condensation product with a saturated acyl halide.

3,586,531

## DIVINYL-MONOVINYL PAINT COMPOSITION AND PAINT PROCESS

Elihu J. Aronoff, Framingham, Mass., and Santokh S. Labana, Dearborn Heights, and Ernest O. McLaughlin, Garden City, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 4, 1969, Ser. No. 847,290
Int. Cl. B44d 1/50; C07c 69/52; C08f 1/24
U.S. Cl. 117—93.31 16 Claims



A substrate is coated with a film-forming composition consisting essentially of monovinyl monomers and a unique divinyl compound and the coating is converted to a tenaciously adhering, solvent-resistant, wear and weather-resistant coating by exposing the coated substrate to ionizing radiation, preferably in the form of an electron beam. The divinyl compound is formed by first reacting a diepoxide with acrylic acid and/or methacrylic acid and subsequently reacting the resultant ester condensation product with a saturated acyl halide.

3,586,532

## ELECTROSTATIC COPY SHEET OF INCREASED SPEED

Robert Freed, Chicago, Ill., assignor to A. B. Dick Company, Niles, Ill.

No Drawing. Filed Apr. 8, 1968, Ser. No. 719,744
Int. Cl. G01d 15/06
U.S. Cl. 117—201 8 Claims

An electrostatic copy sheet formed of a base sheet containing an alkylene glycol having 1–6 carbon atoms and a photoconductive coating of zinc oxide thereon is disclosed. Sensitizing dyestuffs in a solution containing a monohydroxy alcohol are added.

3,586,533

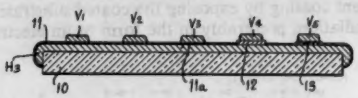
## THIN FILM STRUCTURES

Jack S. Cubert, Willow Grove, and James J. Murphy, Philadelphia, Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Original application Feb. 1, 1965, Ser. No. 429,482, now Patent No. 3,423,646, dated Jan. 21, 1969. Divided and this application Aug. 15, 1968, Ser. No. 766,011
Int. Cl. B44d 1/18; H01l 3/00
U.S. Cl. 117—212 16 Claims

A thin film logic matrix is provided in which a first set of thin film conductors are deposited on an insulating

substrate. A tunneling or insulating overlayer is then formed over the first conductors at selected areas there-




along, and a second group of thin film conductors is then orthogonally deposited over the first conductors at the selected areas.

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3,586,534

## OHMIC CONTACT ELECTRODE TO SEMICONDUCTING CERAMICS AND A METHOD FOR MAKING THE SAME

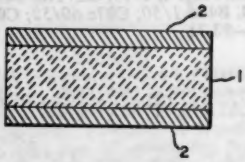
Tsuneharu Nitta and Akio Kuito, Osaka-fu, Kaneomi Nagase, Kyoto-shi, Takashi Iguchi, Kyoto-shi, and Hiromitsu Taki, Sakai-shi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Original application Dec. 5, 1966, Ser. No. 598,997. Divided and this application Apr. 28, 1969, Ser. No. 836,681

Claims priority, application Japan, Dec. 15, 1965, 40/78,430, 40/78,431

Int. Cl. H01l 7/00

U.S. Cl. 117—213 2 Claims




Method for providing ohmic contact to an oxide semiconducting ceramic by immersing the ceramic in an aqueous solution of nickel chloride, hypophosphite and sodium citrate to deposit an alloy of nickel and phosphorus on the ceramic body by autocatalytic reaction, the aqueous solution being maintained throughout the period of immersion at a temperature of 90–100° C. and pH of 3–10.

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3,586,535

## EXTRACTION OF SUGAR CANE AND BAGASSE

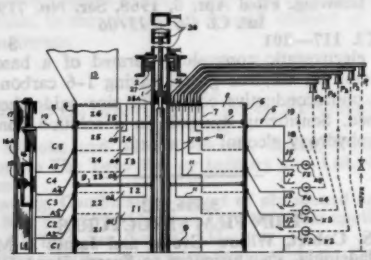
William Robert Crawford, Maryborough, Queensland, Australia, assignor to Walkers, Limited, Maryborough, Queensland, Australia

Filed Dec. 3, 1968, Ser. No. 780,725

Claims priority, application Australia, Dec. 20, 1967, 31,424/67

Int. Cl. C13d 1/12, 1/10; B01d 11/02

U.S. Cl. 127—7 10 Claims



Extraction of sugar juices from prepared (i.e., crushed) sugar cane or bagasse (sometimes known as "megass" or "megasse") by causing the cane or bagasse to gravitate downwardly through an annular space between two concentric walls spinning on vertical axis and introducing imbibition water into a zone adjacent the lower end of the annular column of spinning material. The water is passed through the column by centrifugal action, picking up sugar from that zone and is then collected and reintroduced into the column in the next upwardly adjacent zone. This continues until the water and collected juice is passed through the lower part of the highest zone, from which the liquor is collected and transferred for further treatment. The process is continuous, all zones being under simultaneous treatment with liquor of upwardly increasing degrees of sugar concentration.

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3,586,536

## STARCH PRODUCTS HAVING UNIQUE GELLING PROPERTIES AND PROCESS FOR PREPARING SAME

Felix J. Germino, Palos Park, and Joseph R. Caracci, Jr., Chicago, Ill., assignors to CPC International Inc.

No Drawing. Filed June 12, 1967, Ser. No. 645,527

Int. Cl. C08b 25/02; C13l 1/08

U.S. Cl. 127—32 24 Claims

The bound fat content of granular starch is reduced to not more than 0.15% by weight by heating a mixture of the starch, a suitable solvent, and not more than 15% water, in a confined zone, at from about 225° F. to about 300° F. for not more than 30 minutes, the conditions being selected so as to avoid incipient gelatinization of the starch. Starch treated in accordance with the process which is further characterized by a fluidity of from about 30 to about 80 is an exceptionally fine congealing agent in the manufacture of gum confections.

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3,586,537

## PROCESS FOR THE PRODUCTION OF XYLOSE

Kurt Steiner, Starrkirch, and Herbert Lindlar, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed July 16, 1969, Ser. No. 842,375

Claims priority, application Switzerland, July 26, 1968, 11,285/68

Int. Cl. C13k 9/00

U.S. Cl. 127—37 11 Claims

A process for producing xylose by hydrolyzing a cellulose and xylan containing material with an aqueous solution of oxalic acid. The xylose may be hydrogenated to xylitol.

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3,586,538

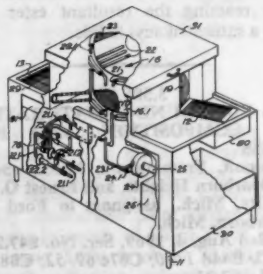
## GLASS STERILIZING APPARATUS

Albert A. Wilson, Vancouver, British Columbia, Canada, assignor to Leland Mfg. Co. Ltd., Vancouver, British Columbia, Canada

Filed Dec. 23, 1968, Ser. No. 786,007

Int. Cl. B08b 3/02

U.S. Cl. 134—68 4 Claims



Sterilizing apparatus having an endless conveyor for feeding articles to be washed onto a turntable which moves the articles through washing, sterilizing and rinsing sprays, after which said articles are removed from the turntable onto a second conveyor by a deflector extending across the turntable in the path of the articles thereon. A parti-

tioned drip collecting pan is located beneath the turntable to prevent intermingling of the sterilizing liquid with the washing and rinsing liquids.

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**3,586,539**

## LEAD ACCUMULATOR WITH DRY STORAGE STABLE CHARGED ELECTRODE PLATES

**Helmut Lauck, Hofheim, Germany, assignor to Varta Aktiengesellschaft, Frankfurt am Main, Germany**

**No Drawing. Filed Aug. 21, 1969, Ser. No. 852,122**
**Claims priority, application Germany, Aug. 24, 1968, P 17 96 066.6**
**Int. Cl. H01m *9/00, 39/00***
**U.S. Cl. 136—26** **12 Claims**

Lead accumulators with dry, storage stable, charged electrode plates, the housing of which contains concentrated sulfuric acid and which is filled with water for activation, wherein the sulfuric acid is present as a gel of acrylic acid, methacrylic acid, or acrylamide and a cross-linking compound.

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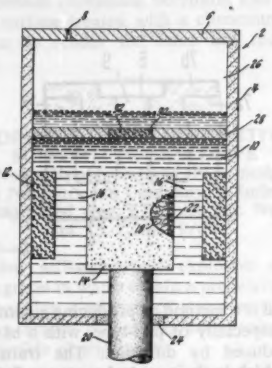
**3,586,540**

## ATTITUDE AND GRAVITY INSENSITIVE GALVANIC CELL

**John J. Petraits, Brownsburg, and George T. Sinnet, Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Oct. 16, 1969, Ser. No. 866,921**
**Int. Cl. H01m *27/00***
**U.S. Cl. 136—86** **3 Claims**



An alkali metal | alkali metal halide | halogen galvanic cell including an excess electrolyte reservoir, an electrochemically active region filled with electrolyte and containing the cell's electrodes, and a porous, carbon or graphite, nonelectrolyte-wettable, electrolyte flow restrictor located between the reservoir and the region. The restrictor keeps the region filled and the electrodes covered with electrolyte regardless of the cell's orientation and acts as an electrolyte relief means to prevent excessive electrolyte pressure buildup in the region. The restrictor's pores are larger than the pores of the carbon or graphite halogen electrode such that the flooding pressure of the restrictor is less than the flooding pressure of the electrode.

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**3,586,541**

## PHOTOSENSITIVE DEVICES COMPRISING ALUMINUM FOIL

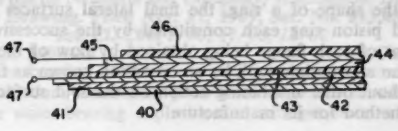
**Rhodes R. Chamberlin, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio**

**Original application Apr. 21, 1966, Ser. No. 544,193, now Patent No. 3,449,705, dated June 10, 1969. Divided and this application Aug. 20, 1968, Ser. No. 812,477**
**Int. Cl. H01v *1/16***
**U.S. Cl. 136—206** **1 Claim**

1. A thin film photovoltaic cell with up to at least 4% solar energy conversion efficiency, comprising

(a) a flexible anodized aluminum foil, and

(b) a plurality of flexible thin films adherently superposed thereon,



(c) at least two of said films forming a photovoltaic barrier junction, at least a portion of each of the said two films having an electrode in ohmic contact therewith, one of the said barrier junction films consisting essentially of CdS of not more than 1.5-micron thickness, the other of said barrier junction films consisting essential of $Cu_xS_y$ of not more than 0.2-micron thickness.

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**3,586,542**

## SEMICONDUCTOR JUNCTION DEVICES

**Alfred U. MacRae, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.**

**Filed Nov. 22, 1968, Ser. No. 778,285**
**Int. Cl. H01l *7/54***
**U.S. Cl. 148—1.5** **4 Claims**

The specification describes an insulating guard ring structure for seminconductive junction devices produced by implanting selected ions around the junction.

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**3,586,543**

## COATING TREATMENT OF METAL SURFACE

**Hiroshi Iijima, Yutaro Goto, and Masaji Terasaka, Kawasaki, Japan, assignors to Nippon Kakan Kabushiki Kaisha**

**No Drawing. Filed Oct. 16, 1968, Ser. No. 768,193**
**Claims priority, application Japan, Oct. 20, 1967, 42/67,253**
**Int. Cl. C23f *15/60***
**U.S. Cl. 148—6.14** **7 Claims**

Improved corrosion resistant films are formed on metal surfaces and coating properties are improved by immersing metals in solutions of molybdic acid or salt thereof and a water soluble organic high polymer. The treatment is particularly effective for steel and galvanized steel sheets and pipes.

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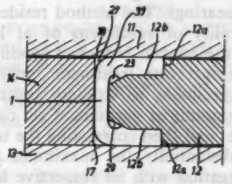
**3,586,544**

## METHOD OF PRODUCING PISTON RINGS

**Robert Geffroy, Neuilly-sur-Seine, France, assignor to Société de Mecanique de Pringy, Pringy Haute-Savoie, France**

**Filed July 17, 1967, Ser. No. 653,742**
**Claims priority, application France, July 20, 1966, 70,156, 70,157**
**Int. Cl. C21d *7/02, 9/40;* B23p *15/06***
**U.S. Cl. 148—12** **9 Claims**



An elastic piston ring, generally employed as a scraper ring and also known as an oil control ring, of spring steel

of the U-section type, made from a strip of rolled steel comprising a grooved web and flanges cut-out in alternate folded portions so as to have a cross-section of U-shape, the said band being then cut into lengths which are rolled to the shape of a ring, the final lateral surfaces of the said piston ring each constituted by the successive sections of each flange being obtained by flow of the metal in an appropriate tool, by an operation known as forging, without other machining action on the said surfaces and a method for its manufacture.

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**ERRATUM**

For Class 148—012 see:
Patent No. 3,586,742

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**3,586,545**
**METHOD OF MAKING THIN-GAUGE ORIENTED ELECTRICAL STEEL SHEET**
Edward B. Stanley, Washington Township, Westmoreland County, Pa., assignor to United States Steel Corporation
No Drawing. Filed Apr. 23, 1969, Ser. No. 818,816
Int. Cl. H01f 1/16
U.S. Cl. 148—111 8 Claims

A method of producing cube-on-edge oriented silicon-iron sheet stock 0.005 to 0.010 inch thick utilizing a triple cold reduction of the silicon-iron hot band wherein each cold reduction is followed by annealing and the product is finally box annealed to effect the grain orientation. Either the second or third anneal must be a decarburizing anneal, and there must be about a 50 percent thickness reduction during the first and third cold reduction.

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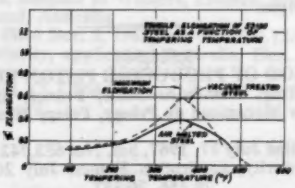
**3,586,546**
**METHOD FOR DETERMINING OPTIMUM FATIGUE LIFE OF BEARING STEELS**
Benjamin L. Averbach, Belmont, Mass., and Philip K. Pearson, Farmington, Conn., assignors to Textron Inc., Providence, R.I.
Filed July 29, 1968, Ser. No. 748,327
Int. Cl. C21d 9/40; G01n 25/00
U.S. Cl. 148—128 7 Claims



A direct method is proposed for providing a tempered steel composition exhibiting optimum resistance to fatigue particularly in bearings. The method resides in subjecting each of a plurality of specimens of at least one steel composition in the quench hardened condition to a series of tempering temperature treatments, subjecting each of the tempered specimens to strength testing whereby to determine the amount of permanent set or percent elongation at failure, and then correlating the tempered specimen having substantially the maximum permanent set or percent elongation with its respective tempering temperature, the correlated temperature being the temperature at which a quench hardened element of the same steel composition may be tempered to provide optimum resistance to fatigue.

**3,586,547**
**METHOD OF PRODUCING A SILICON AVALANCHE DIODE**
William B. Glendinning, Belford, and Albert Mark, Toms River, N.J., assignors to the United States of America as represented by the Secretary of the Army
No Drawing. Filed Mar. 18, 1969, Ser. No. 808,352
Int. Cl. B01j 17/00; H01l 7/50
U.S. Cl. 148—175 1 Claim

A silicon substrate of (111) surface orientation is treated by growing a thermal oxide layer onto one surface of the substrate, etching windows through the thermal oxide layer, and vapor etching flat bottomed cavities through the windows using a hydrogen chloride-hydrogen vapor etch at 1150 degrees C. for six minutes and wherein the halide mole fraction of the vapor is about 0.02.

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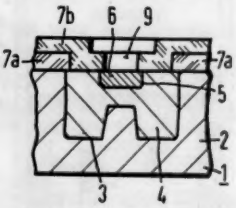
**3,586,548**
**METHOD OF PRODUCING A GERMANIUM-PLANAR TRANSISTOR, PARTICULARLY OF PNP-TYPE**
Dieter Pommerrenig, Alexandria, Va., assignor to Siemens Aktiengesellschaft
Filed Oct. 19, 1967, Ser. No. 676,482
Claims priority, application Germany, Oct. 21, 1966, S 106,631
Int. Cl. H01l 7/44
U.S. Cl. 148—187 3 Claims




Described is a method of producing a germanium planar transistor, especially of pnp-type, with a base and emitter region produced by diffusion. The transistor has p-n junctions which in their central parts are flat, adjacent and parallel to each other. The method is characterized by the fact that, following the production of the first tub-shaped base region, an activator determining the emitter region is so diffused into the base region, it influences the collector-base junction, whereby the portions of the collector-base junction positioned opposite the planar central portion of the emitter-base junction are prevented, in contradistinction to the edge portions of said junction, from a noticeable penetration into the collector region, as a result of the influence of the emitter activator. The shape of the collector-base junction, obtained in this manner, is maintained in the finished transistor.

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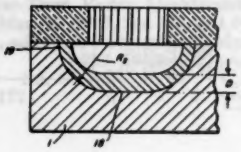
**3,586,549**
**METHOD OF PRODUCING DIFFUSED JUNCTIONS IN PLANAR SEMICONDUCTIVE DEVICES**
Peter V. Gray, Scotia, N.Y., assignor to General Electric Company
Original application Aug. 2, 1965, Ser. No. 476,512, now Patent No. 3,514,346, dated May 26, 1970. Divided and this application Aug. 8, 1969, Ser. No. 862,573
Int. Cl. H01l 7/34, 7/50
U.S. Cl. 148—187 5 Claims

In the fabrication of diffused planar semiconductive devices, junctions having reduced radius of curvatures are

produced by etching the surface of the semiconductor after etching away of a diffusion mask and prior to acti-



vator into the semiconductor. Resultant devices have higher breakdown voltages and lower leakage currents.

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3,586,550

**LIQUID PROPELLANT CONTAINING CHROMIUM COATED BERYLLIUM POWDER DISPERSED THERETHROUGH**

**Simon J. Morana, Hazleton, Pa., assignor to Kawecki Berylco Industries, Inc.**

**No Drawing. Filed Mar. 26, 1965, Ser. No. 443,161**
**Int. Cl. C06b** *15/00*
**U.S. Cl. 149—1** **5 Claims**

This invention relates to improvements in liquid propellants. An object of the present invention is to provide a liquid propellant containing beryllium and wherein the beryllium is surface treated with a chromium containing coating so as to render the same less reactive to its environment.

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3,586,551

**WATER-DEGRADABLE CAP-SENSITIVE SELF-SUPPORTING EXPLOSIVE**

**Edmond J. Nolan, Newfoundland, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed Aug. 27, 1968, Ser. No. 755,723**
**Int. Cl. C06b** *19/00*
**U.S. Cl. 149—2** **7 Claims**

Cap-sensitive self-supporting explosive composition, which disintegrates in water within a predetermined period of time, comprising a mixture of a cap-sensitive high explosive and a binder comprising water-soluble polymer and water-miscible plasticizer.

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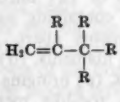
3,586,552

**PROPELLANT COMPOSITION HAVING A CURABLE ETHYLENE INTERPOLYMER BINDER**

**James E. Potts, Millington, and Arnold C. Ashcraft, Jr., Somerset, N.J., and Edgar W. Wise, Charleston, W. Va., assignors to Union Carbide Corporation**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 481,907, Aug. 23, 1965. This application May 23, 1968, Ser. No. 733,218**
**Int. Cl. C06d** *5/06*
**U.S. Cl. 149—19** **42 Claims**

Curable solid fuel propellant composition having as the binder a saturated hydrocarbon prepolymer having reactive functional groups at the ends of each polymer molecule comprising a free-radical initiated interpolymer of ethylene and an alpha-olefin having the formula



wherein each R individually represents hydrogen, an alkyl group of 1 to 6 carbon atoms or fluorine and a cross-linking agent capable of reacting with the reactive functional groups.

3,586,553

**WATER-BEARING EXPLOSIVE CONTAINING PROTEIN AND NITROGEN-BASE SALT**

**Philip W. Fearnow, Hagerstown, Md., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed Apr. 11, 1969, Ser. No. 815,487**
**Int. Cl. C06l** *1/00, 11/00, 15/02*
**U.S. Cl. 149—92** **20 Claims**

Water-bearing explosives containing inorganic oxidizing salt, fuel, thickener, proteinaceous material soluble in the water-bearing explosive and nitrogen-base salt.

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3,586,554

**PROCESS FOR INCREASING PHOTORESIST ADHESION TO A SEMICONDUCTOR BY TREATING THE SEMICONDUCTOR WITH A DISILYLAMIDE**

**Roger A. Couture, Richmond, Robert T. Gleason, South Burlington, and John J. Lajza, Jr., Williston, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 15, 1969, Ser. No. 791,214**
**Int. Cl. H01l** *7/00*
**U.S. Cl. 156—17** **11 Claims**

Very small patterns may be etched in silicon dioxide or other oxide surfaces using photoresist to mask areas of surfaces where etching is not desired by applying a disilylamide to the surface to increase the ahesion of the photoresist. The process is particularly useful for etching patterns in silicon dioxide masks used in the fabrication of microminiature semiconductor devices.

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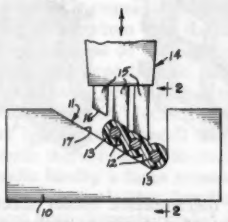
3,586,555

**APPARATUS AND METHOD OF CONTINUOUSLY JOINING THERMOPLASTIC COATED WIRES**

**Thomas B. Sager, Plymouth Valley, Pa., assignor to Ultrasonic Systems, Inc., Farmingdale, N.Y.**

**Filed Aug. 1, 1969, Ser. No. 846,741**
**Int. Cl. H01b** *13/06;* **B29c** *27/08*
**U.S. Cl. 156—55** **6 Claims**



An apparatus and method of joining a plurality of thermoplastic coated wires in a continuous process by means of a molecular bond between adjacent wires and permitting each wire to be color coded for installation purposes. The molecular bond is sufficient to maintain the wires in assembled joined relation but permitting the wires to be separated for installation purposes.

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3,586,556

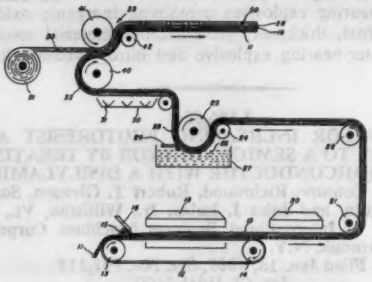
**PROCESS FOR PRODUCING VINYL CHLORIDE POLYMER FOAM LAMINATES**

**James R. Clark, Princeton, N.J., and Frank E. Ehrenfeld, Jr., Brookhaven, Pa., assignors to Congoleum Industries, Inc., Kearny, N.J.**

**Filed Mar. 17, 1967, Ser. No. 623,869**
**Int. Cl. B32b** *5/18*
**U.S. Cl. 156—79** **6 Claims**

The invention relates to a process for producing a laminate containing a vinyl chloride polymer foam interlayer adhesively secured to a resinous composition wear layer. The process involves a first stage of applying a vinyl chloride polymer composition containing a chemical blowing

agent as a smooth layer on a base and then heating the composition to decompose the blowing agent and form a foam layer on the base. The second stage of the process involves cooling the foam layer, applying an adhesive



layer containing a volatile vehicle to a surface of the foam layer, heating to remove the volatile vehicle and then laminating the adhesive-covered foam to a resinous composition wear layer.

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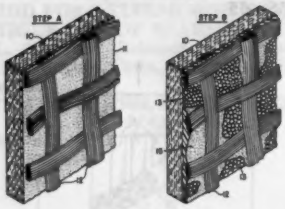
3,586,557

## MICACEOUS INSULATION AND ELECTRICAL APPARATUS INSULATED THEREWITH

Dow A. Rogers, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 8, 1968, Ser. No. 700,339
Int. Cl. B32b *31/14*
U.S. Cl. 156—85 12 Claims




A thin solid thermoplastic binder sheet is sandwiched between a sheet of micaceous insulation and a fibrous substrate or backing sheet such as polyester fiber webbing or glass fiber cloth. The composite is heated and pressed together. The thermoplastic binder sheet softens and bonds the fibers of the backing to the mica sheet. The thermoplastic sheet also shrinks so that film discontinuities are formed in areas between the fibers of the backing. The resulting composite insulation has excellent physical and electrical properties and is permeable to liquid insulating varnishes or resins.

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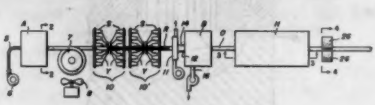
3,586,558

## CONTINUOUS MANUFACTURE OF REINFORCED HOSE

Frederick M. Galloway, Coraopolis, Pa., Samuel William Riley, Trenton, N.J., and Robert H. Sinnamon, Huntingdon Valley, Pa., assignors to H. K. Porter Company, Inc., Pittsburgh, Pa.

Filed Nov. 28, 1967, Ser. No. 686,037
Int. Cl. B29b *17/02*
U.S. Cl. 156—149 5 Claims

This invention provides a method of and apparatus for continuously manufacturing elastomeric hose having reinforcement in the form of knitted, woven, braided or lapped textile yarns or the like between extruded elastomeric inner and outer layers the elastomeric components of which are cured in a continuous vulcanizer as the hose



passes through it, fluid pressure being maintained in the hose to preserve its cylindrical form as rapidly moving, chemically inert, hot solid particles impart curing heat to it.

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3,586,559

## METHOD OF TEMPORARILY SECURING A WORKPIECE TO A WORKHOLDER

Robert W. Shepard, San Diego, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

No Drawing. Filed July 1, 1968, Ser. No. 741,287
Int. Cl. B32b *35/00*
U.S. Cl. 156—155 5 Claims

A method of mixing the ingredients of a composition for adhering a workpiece to a workholder, applying the mixture to the workpiece and removing same when the work function is completed is disclosed. The composition comprises 10–25% by weight of activated charcoal, 1–10% by weight of a plasticizer and the balance of a hold-down type wax such as o-terphenyl or paraffin.

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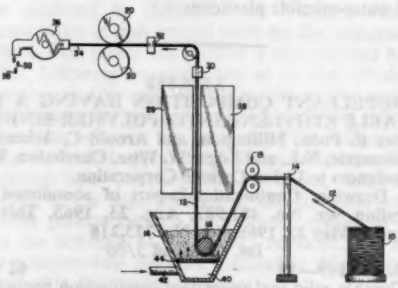
3,586,560

## METHOD OF MAKING A FIBER-FILLED THERMOPLASTIC ARTICLE

James G. Stranch and Max L. Carroll, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 17, 1968, Ser. No. 737,708
Int. Cl. B22b *31/00*; B65h *81/00*
U.S. Cl. 156—167 7 Claims



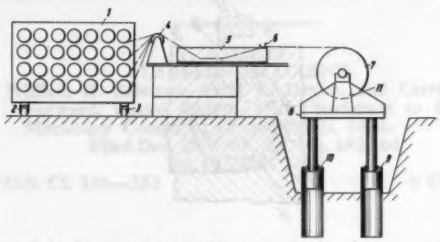
A method for forming a fiber-filled organic plastic including the steps of (a) introducing continuous filaments into a fluid containing particles of a plastic (b) spreading the filaments apart, (c) evenly distributing the particles on the filaments, (d) coalescing the particles to coat the filaments, (e) bringing the coatings into mutual contact forming a rod-like member, (f) severing the rod-like member into short lengths. The apparatus includes a container having particles of a plastic entrained in a fluid therein, spreading means, an oven, a die and a cutter.

3,586,561

## PROCESS AND APPARATUS FOR THE MANUFACTURE OF FIBER GLASS REINFORCED PLASTIC TUBES AND SIMILAR BODIES

Ludwig Wesch, Heidelberg, Germany, assignor to Mancar-Trust, Vaduz, Liechtenstein

Filed Mar. 17, 1967, Ser. No. 624,065
Claims priority, application Switzerland, Mar. 24, 1966, 4,262/66
Int. Cl. B65h *81/02*
U.S. Cl. 156—172 8 Claims



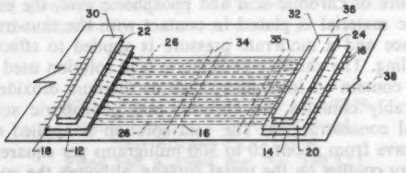
A process and apparatus for manufacturing reinforced fiber glass tubes including the step of spooling a plurality of roving strands impregnated with liquid synthetic resin onto a rotatably mounted and vertically adjustable winding cylinder drum. The roving strands are either first passed through at least one impregnating bath prior to being spooled onto said drum, or they are passed through at least one heating installation where the synthetic resin of the already impregnated roving strands is softened prior to the spooling of the impregnated roving strands onto said drum, onto which said roving strands are directly guided from said impregnating bath, respectively heating installation; thereafter the roving strands pass through other means forming part of the overall apparatus.

3,586,562

## METHOD OF MAKING SCRAMBLED BRANCHED FIBER OPTICS

James A. Jones, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Sept. 24, 1969, Ser. No. 860,545
Int. Cl. B65h *81/00*; G02b *5/16*
U.S. Cl. 156—174 15 Claims



A method for uniform or mixed scrambling of branched fiber optics, winds an initial layer of fiber on a drum of a fiber drawing machine which has spaced, double-faced tape placed on the drum parallel to the axis of the drum, and the fibers strands are placed approximately two diameters apart. A second layer of tape is placed over the fibers and on the first layer of tape, and a second layer of fiber is wound around the drum in the space between the fibers of the first layer. A final layer of tape is placed over the second layer of tape above the other layers of tape. The fibers intermediate the tape strips are secured together by lacquer or cement, and the fibers are then cut in the lacquered section. A cut is made centerwise of the tape strips along a line parallel to the axis of the drum forming a strip of fibers with one lacquered end and a divided taped end. The lacquered end is then rolled into the desired cross-sectional configuration, and the separated layers in the tape section are then rolled into the desired configuration forming an optical fiber with a common end and a branched end.

3,586,563

## METHOD FOR PRODUCING AN OPTICAL FIBER BUNDLE

Masaharu Fukkami, Heizaburo Takagi, and Toshio Nakatsubo, Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed June 10, 1969, Ser. No. 831,940
Int. Cl. G02b *5/16*
U.S. Cl. 156—174 16 Claims

Method for producing an optical fiber bundle by winding at least one optical fiber element onto a drum while it is rotated in one direction so that a layer of the helically closely wound windings of the optical fiber element is formed on the drum. The optical fiber element is folded back upon itself at the end of the thus formed layer of the optical fiber element while the rotation of the drum is reversed so that a succeeding layer of the optical fiber element is formed on the preceding layer. The sense of the helical angle of the windings in each of the layers in thus kept the same.

The unit optical fiber bundles each having the cross-section in the form of a trapezoid or a regular triangle, the trapezoid having a bottom side the length of which is two times as long as that of the remaining three sides of the same length and opposite two side symmetrically inclined with respect to the center line of the cross-section with the included angle of 60° formed therebetween. The unit optical fiber bundles are bonded with each other at the respective ends thereof so as to form a composite optical fiber bundle having a large cross-sectional area.

Each of the unit optical fiber bundles comprises a plurality of optical fiber elements bonded with each other through the length thereof so that the cross-section of the same is made in the form of a triangle. The unit optical fiber bundles are bonded with each other at the respective ends thereof so that a composite optical fiber bundle having a large cross-sectional area is formed.

3,586,564

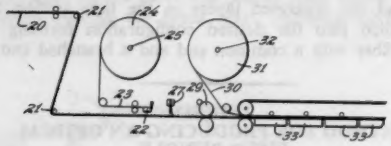
## METHOD OF REINFORCING CORRUGATED PAPERBOARD

John C. Brackett, St. Paul, Minn., assignor to Hoerner Waldorf Corporation, Ramsey County, Minn.

Original application Oct. 24, 1965, Ser. No. 504,575, now Patent No. 3,411,689, dated Nov. 19, 1968. Divided and this application Sept. 10, 1968, Ser. No. 758,748
Int. Cl. B31f *1/20*
U.S. Cl. 156—210 7 Claims

This invention relates to a method of reinforcing corrugated paperboard. Single face corrugated paperboard is formed, and then elongated strips of thermoplastic material are dropped into the valleys formed between the corrugations at spaced intervals. The second liner is adhered to the corrugated medium to enclose the strips. The double face corrugated board is heated to dry the adhesive and

render the reinforcing strips tacky to adhere to the corrugated medium. The corrugated may then be creased



transversely of the flutes while the thermoplastic material is soft, and made into container blanks.

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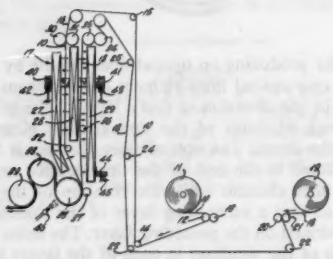
**3,586,565**

**METHOD AND APPARATUS FOR THE MANUFACTURE OF CELLULAR AND LAMINATED MATERIALS**

**Alfred W. Fielding, Wayne, N.J., assignor to Sealed Air Corporation, Hawthorne, N.J.**

**Filed Dec. 4, 1968, Ser. No. 781,070**
**Int. Cl. B31f** *1/20*
**U.S. Cl. 156—210** **11 Claims**



Method and apparatus for manufacturing laminated and laminated cellular materials wherein two sheets of heat sealable plastic material are fed downwardly between radiant heating devices to gradually raise the temperature of the sheets to sealing temperatures, the sheets being substantially unsupported during their downward travel with the final temperature attained just prior to the application of the sheets to an embossing and/or laminating roller for sealing the sheets one to the other and in the case wherein one sheet is embossed to form a plurality of discrete hermetically sealed cells.

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**3,586,566**

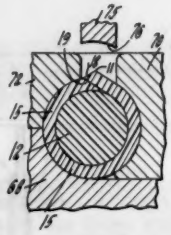
**PROCESS OF ENCAPSULATING AN O-RING**

**Frank Roy Van Vleet, North Reading, and David Gilbert Way, Boxborough, Mass., assignors to A. W. Chesterton Company, Everett, Mass.**

**Continuation of application Ser. No. 499,179, Oct. 21, 1965. This application Sept. 19, 1968, Ser. No. 760,825**
**Int. Cl. B32b** *31/04*
**U.S. Cl. 156—293** **7 Claims**

This disclosure relates to a novel process and apparatus for encapsulating an O ring, as well as a composite O ring. In general, the encapsulating process of the invention consists of forming a continuous C shaped cover band, inserting an O ring core therein and sealing the band edges together to complete the encapsulation.

The core forming process comprises conforming plastic sheet material to the undercut portion of a mold pressurizing the outer surface of the sheet material while retracting the mold, providing a formed article having separate portions connected by a C-shaped deformation. The forming apparatus has a base and female member, including a pressure chamber, relatively movable together and a male mold slidably mounted in the base having undercut portions thereadjacent. Trimming apparatus for the article and a sealing press for completing the encapsulation process are also disclosed.



The composite O ring provided is characterized by a cover having a single overlapping heat seal joint around a single axially facing side thereof.

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**3,586,567**

**PROCESS OF PRODUCING FOAM SHEET STRUCTURES**

**Joseph Henry Ryan, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed Aug. 5, 1968, Ser. No. 750,002**
**Int. Cl. C09j** *5/00*
**U.S. Cl. 156—306** **5 Claims**

Process for heat-bonding a stack of thin foam sheets by passing a heated gas parallel to the plane of the sheets therethrough.

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**3,586,568**

**PROCESS FOR BONDING ELASTOMERIC MATERIALS TO METALS**

**Donald H. Campbell, Niagara-on-the-Lake, Ontario, Canada, assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.**

**No Drawing. Filed July 26, 1967, Ser. No. 656,071**
**Int. Cl. C09j** *5/02*
**U.S. Cl. 156—308** **8 Claims**

A process for bonding an elastomeric material to a metal surface wherein the metal surface is treated with a mixture of chromic acid and phosphoric acid, the elastomeric material is placed in contact with the thus-treated surface and a moderate pressure is applied to effect the bonding. The chromic-phosphoric acid solution used may also contain an inert filler, such as titanium dioxide and desirably contains the chromic and phosphoric acid in equal concentrations. The acid solution is applied so as to leave from about 20 to 300 milligrams per square foot of dry coating on the metal surface, although the coating is not permitted to dry completely before the application of the elastomeric material. Numerous natural and synthetic rubbers can thus be bonded to surfaces of steel, aluminum, or zinc by this method.

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**3,586,569**

**SEALING OF SURFACE SULFONATED PLASTIC SHAPED ARTICLES**

**Robert J. Caiola, Saginaw, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**No Drawing. Filed Apr. 23, 1969, Ser. No. 818,817**
**Int. Cl. C09j** *3/00*
**U.S. Cl. 156—308** **7 Claims**

Surface sulfonated shaped articles of thermoplastic organic polymers are sealed at temperatures below the

heat distortion temperature of the polymer by (1) treating at least a portion of the article surface with a liquid which is a non-solvent for the base polymer and a solvent for the sulfonated polymer on the surface, e.g., water, (2) positioning the treated surface against another surface of surface sulfonated shape article such that the liquid is disposed therebetween and (3) removing the liquid at temperatures below the heat distortion point of the polymer. The above sealing method is reversible in that soaking the sealed portion of shaped article in a suitable sealing liquid releases the seal without damaging the article.

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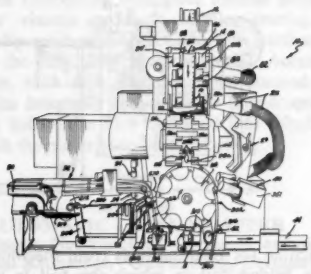
**3,586,570**
**LABELING MACHINE**
**William H. Solomon, John R. Davies, and Carrel M. Forward, Grand Rapids, Mich., assignors to Oliver Machinery Company, Grand Rapids, Mich.**
**Filed Dec. 20, 1967, Ser. No. 692,104**
**Int. Cl. B26d *5/00***
**U.S. Cl. 156—353** **6 Claims**



A labeling machine, system, and method capable of accommodating offset printed label tapes or other label tapes having discontinuities between the individual labels of a repeat print pattern, with feeding and severing such in controlled fashion utilizing a printed indicia code and a two stage feeding and cutting cycle, while uniquely securing and advancing articles or containers to be labeled with novel equipment, both in a manner to allow extremely accurate and dependable label application and subsequent label verification on the article as well as label position checking, and with discharge means positively governing discharge of the labeled articles according to acceptability or non-acceptability.

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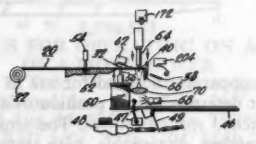
**3,586,571**
**FILM PROCESSING APPARATUS**
**James Szakacs, 150 Pueblo Road, New Britain, Pa. 18901**
**Filed Jan. 6, 1969, Ser. No. 789,123**
**Int. Cl. B32b *31/18***
**U.S. Cl. 156—353** **16 Claims**



Apparatus for automatically photographing identifying indicia on the end of a roll of exposed undeveloped film while simultaneously trimming the film end and punching the film to permit the splicing together of a plurality of such films in proper registration to form a continuous roll of film for further processing.

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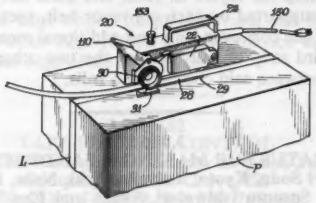
**3,586,572**
**ELECTRICALLY CONTROLLED HANDTOOL FOR FRICTION-FUSING NONMETALLIC STRAP**
**Arvid I. Ericsson, Fort Lauderdale, Fla., assignor to Signode Corporation**
**Filed Feb. 20, 1969, Ser. No. 801,133**
**Int. Cl. B29c *19/02*; G05g *15/00***
**U.S. Cl. 156—359** **30 Claims**



A compact, portable tool for friction-fusing overlapping portions of a tensioned article binding loop, which includes a rotatably mounted strap gripping member for compressing interface regions of the overlapping strap portions into frictional engagement with one another, with drive means being provided for first intermittently rotating the strap gripping member in a first direction to withdraw one of the strap end portions to constrict the loop about the article, and with the drive means then being operative to oscillate the gripping member to cause interface melting between the overlapping strap portions, whereby the melted surface regions may fuse to achieve interface solidification. The drive means includes an electric motor having a rotary output shaft, with the rotary motion of the shaft being converted into rocking movement, and with the rocking movement being converted into intermittent rotary movement of the strap gripping member. When a predetermined amount of tension is drawn within the strap loop, the intermittent rotary motion of the strap gripping member is converted to oscillating movement to effect the friction-fusion joinder of the overlapping strap portions.

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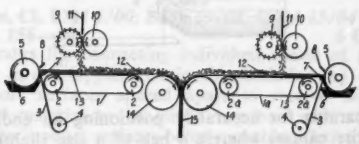
**3,586,573**
**APPARATUSES FOR MAKING REINFORCED PLATES OF SYNTHETIC RESIN**
**Herbert Vissers, Nieuw-Vennep, Netherlands, assignor to Landbouwwerktuigen- en Machinefabriek H. Vissers N.V., Nieuw-Vennep, Netherlands**
**Continuation-in-part of abandoned application Ser. No. 584,524, Oct. 5, 1966. This application Oct. 20, 1969, Ser. No. 867,854**
**Claims priority, application Netherlands, Oct. 19, 1965, 6513483; Feb. 4, 1966, 6601422; May 13, 1966, 6606571**
**Int. Cl. B29j *5/08*; D04h *1/16***
**U.S. Cl. 156—372** **14 Claims**



An apparatus for making a reinforced plate of synthetic resin, essentially comprising two conveyor belts for supporting each a strip of foil, said conveyor belts each being

associated with foil supply and foil guide means, means for applying a layer of liquid resin on the foil and means for depositing pieces of glass fibre on the liquid resin, and being mounted for feeding the strips of foil together with the layers of resin and glass fibre pieces thereon, in a converging manner towards a nip between two co-operating compression rolls where the two strips of foil are brought together with the layers of liquid resin and glass fibre pieces therebetween and the composite strip thus formed is compressed to complete the reinforced plate of synthetic resin. The two conveyor belts are substantially in the same plane whilst the nip between the two compression rolls is perpendicular to that plane. Special embodiments comprise the arrangement of pressure members for precompressing the layers of resin and glass fibre pieces on the foil supported by each conveyor belt, special arrangements of the conveyor belts and additional means for feeding a third strip of foil between the two other strips into the nip between said compression rolls.

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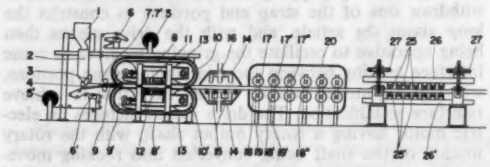
**3,586,574**

**APPARATUS FOR MAKING A SANDWICH PANEL**

**Shigenari Soda, Kyoto, Tatsujiro Seki, Nara, Hiroji Abu, Suita, Susumu Ishiwatari, Sakai, and Ken Yamamoto, Nara, Japan, assignors to Seikisui Sponge Kogyo Kabushiki Kaisha, Kita-ku, Osaka-shi, Japan**

**Filed June 13, 1968, Ser. No. 736,814**
**Claims priority, application Japan, June 21, 1967, 42/40,077**
**Int. Cl. B29d *7/14;* B29b *31/26***
**U.S. Cl. 156—380** **2 Claims**



Apparatus for continuous forming of sandwich-type panels having a porous thermoplastic resin layer interposed between and affixed to outer sheets of facing material.

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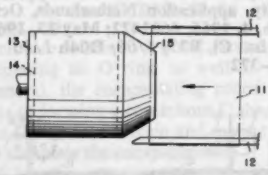
**3,586,575**

**APPARATUS FOR POSITIONING AN ENDLESS BELT ON A TIRE CARCASS**

**Thomas A. Wells, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.**

**Filed Apr. 7, 1969, Ser. No. 813,960**
**Int. Cl. B29h *17/24***
**U.S. Cl. 156—394** **3 Claims**



Apparatus for accurately positioning an endless belt on a tire carcass wherein a belt of a size slightly larger than the circumference of the carcass is positioned surrounding the tire carcass and spaced therefrom, and the relative size of the belt or carcass is adjusted so that the belt contacts the tire carcass.

**3,586,576**

**FORMING SOFTWOOD PLYWOOD**

**Leopold F. Bornstein, King of Prussia, Pa., assignor to Georgia Pacific Corporation, Portland, Oreg.**

**No Drawing. Filed Feb. 19, 1969, Ser. No. 800,760**
**Int. Cl. C09j *3/16***
**U.S. Cl. 156—335** **1 Claim**

The excessive penetration of softwood plies by alkaline, water solutions of thermosetting phenolic resins can be controlled by incorporating aluminum sulphate in the resin solution prior to application to the plies.

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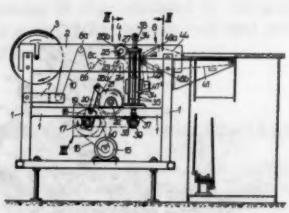
**3,586,577**

**BAG SEALING MACHINE**

**Italo Della Bella, 9 Gutenbergstrasse, 6501 Worrstadt (Rhine), Germany**

**Filed Nov. 6, 1968, Ser. No. 773,769**
**Claims priority, application Germany, Nov. 11, 1967, D 54,594**
**Int. Cl. B26d *5/00***
**U.S. Cl. 156—351** **33 Claims**



A machine for forming bags from thermoplastic longitudinally folded foil in which the foil is intermittently fed to a sealing device in predetermined lengths corresponding to the desired width of the bags, with the sealing device severing the foil and simultaneously sealing the severed edges thereof.

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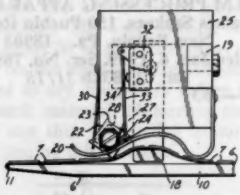
**3,586,578**

**SENSING AND CONTROL MECHANISM FOR LABEL DISPENSER**

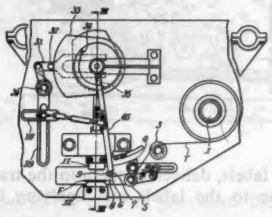
**Arthur C. Dickerson, St. Paul, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.**

**Filed Mar. 10, 1969, Ser. No. 805,575**
**Int. Cl. B65h *25/04;* B32b *31/18***
**U.S. Cl. 156—361** **3 Claims**



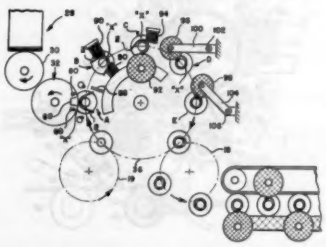
A sensing apparatus adapted for use in controlling the movement or determining the position of a carrier web to which is attached spaced articles. The sensing device is a rotatable member engageable with successive leading edges of the articles causing rotation of the same and actuation, through a cam rotated in response to rotation of the sensing device, and means for controlling the movement or position of the articles.

3,586,579
**APPARATUS FOR FORMING TEARING TAPE PIECES ON A WEB OF PACKAGING FILM TO BE USED IN SUCCESSIVELY FORMING INDIVIDUAL TUBULAR PACKAGES**
Seiichi Kawakami, Suzuka-shi, Japan, assignor to Asahi Dow Limited, Tokyo, Japan
Filed Nov. 21, 1968, Ser. No. 777,794
Claims priority, application Japan, Jan. 25, 1968, 43/3,967
Int. Cl. B32b *31/00*
U.S. Cl. 156—380 4 Claims



Tape pieces formed on individual tubular packages of semi-fluid or viscous products as film tearing means should be fully solid with the casing film particularly in cases where the film is of tough material. According to the invention, such tape pieces can be formed on the packaging film integrally therewith by high-frequency or heat welding before the film is shaped into tubular form and filled with the material to be packaged.

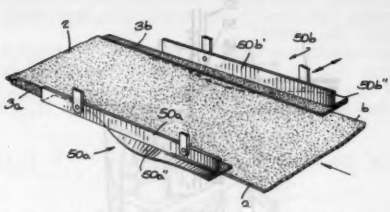
3,586,580
**AUTOMATIC LABEL WRAPPER**
Karl Dullinger, Neutraubling, Germany, assignor to Herman Kronseder, Neutraubling, Germany
Filed Aug. 25, 1967, Ser. No. 663,289
Int. Cl. B65c *9/04*
U.S. Cl. 156—458 9 Claims



Disclosed herein is a label applying thrust and a label pressing arrangement for a continuously moving labeling machine. The label applying turret has a number of pairs of label clamps equally spaced about the periphery of the turret to grip the ends or wings of labels as the labels are fed to the label turret. The pressing arrangement includes a number of pressure rollers to press the labels against the bottles.

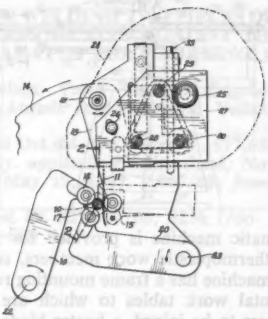
3,586,581
**APPARATUS FOR OPERATING ON AN EDGE OF A MOVING WEB**
Charles E. Todd, Detroit, Mich., assignor to Uniroyal, Inc., New York, N.Y.
Filed Aug. 12, 1968, Ser. No. 751,952
Int. Cl. B31f *5/08*; B32b *3/04*; B65h *25/26*
U.S. Cl. 156—467 11 Claims

An apparatus for accurately applying edge ribbons to a continuous fabric strip of material which includes a pair of sensing devices for sensing the lateral positions of the edges of the strip material and mechanism for maintaining one of said edges of the strip material in registry with one



of a pair of edge ribbon turnover devices and for maintaining the other edge ribbon turnover device in registry with the other edge of the strip material.

3,586,582
**TAPE POSITION CONTROL**
Egons Inka, Chicago, Ill., assignor to Crane Packing Company, Morton Grove, Ill.
Filed Oct. 14, 1968, Ser. No. 767,408
Int. Cl. B65h *81/02*
U.S. Cl. 156—468 1 Claim

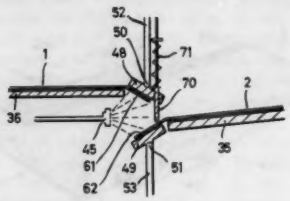


An improvement upon a machine for wrapping polytetrafluoroethylene tape upon the threads of a fitting, comprising providing chain-connected nuts held captive in a tape support for simultaneously adjusting said nuts to change the location of the tape relative to the end of the fitting to be wrapped and to the knife by which the wrapped tape is severed.

3,586,583
**DEVICE FOR THE PRODUCTION OF LARGE-AREA SHEETS FORMED OF PLASTICS, PARTICULARLY FOR THE ROOFS OF BUILDINGS**
Edwin K. Ospelt, 9494 Schaan, 737 Liechtenstein
Filed Mar. 20, 1967, Ser. No. 624,462
Claims priority, application Germany, Mar. 24, 1966, P 39,048
Int. Cl. B31f *5/00*; B65h *19/08*; G03d *15/04*
U.S. Cl. 156—502 6 Claims

Apparatus for connecting individual sheets of plastic material in overlapping relationship includes (a) a pair of support surfaces spaced apart to receive separate sheets of material to be joined together, with at least one of the support surfaces being movable relative to the other so that their upper surfaces can be brought into and out of alignment with one another, (b) a row of spraying devices for applying a welding solvent to exposed edge surfaces of the separate sheets of material,

and (c) opposed pressing members which can be moved toward each other to effect an overlapping engagement of




the exposed edge surfaces of the sheets after they have been coated with welding solvent.

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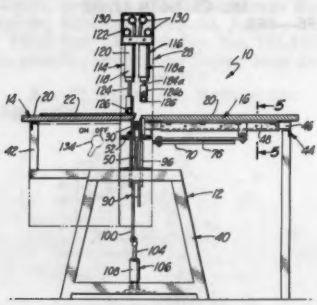
**3,586,584**

## AUTOMATIC PLASTIC WELDING MACHINE

**Chester Wilkins, 741 W. La Denny Drive, Ontario, Calif. 91764**

**Filed Oct. 28, 1968, Ser. No. 770,969**
**Int. Cl. B29c *27/02***
**U.S. Cl. 156—499** **7 Claims**




An automatic machine is provided for formally butt welding to thermoplastic work members, such as plastic sheets. The machine has a frame mounting relatively movable horizontal work tables to which are clamped the work members to be joined, a heater blade which moves vertically between the tables, and an automatic control system which is operable to cause the machine to proceed through an automatic work cycle involving initial retraction of the work tables to separate the work members, heating of the blade to a predetermined temperature, movement of the heated blade to an extended position between the work members, inward extension of the work tables toward one another to engage the confronting edge surfaces of the work members with opposite sides of the blade, whereby these edge surfaces are heated to a tacky state, momentary retraction of the work tables to separate the work members, retraction of the heater blade from between the work members, and final inward extension of the work tables to press the tacky surfaces of the work members firmly together for a period of time sufficient to enable firm bonding of the members to one another.

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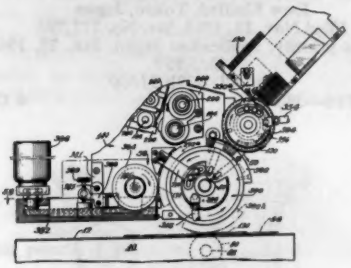
**3,586,585**

## ADDRESSING MACHINE

**Harry V. Kirk and James E. Doane, Mundelein, Ill., assignors to Xerox, Inc.**

**Original application Nov. 1, 1965, Ser. No. 505,930. Divided and this application June 30, 1969, Ser. No. 869,409**
**Int. Cl. B65b *9/10, 9/46*; B32b *31/20***
**U.S. Cl. 156—521** **5 Claims**

An article addressing machine having label transfer means to bring individual labels into transfer contact with articles to be addressed and transfer address information from the address to the article, including means for accumulating the used labels and means for withdraw-



ing the used labels, delivering them to the transfer means, applying glue to the labels and applying the labels to articles.

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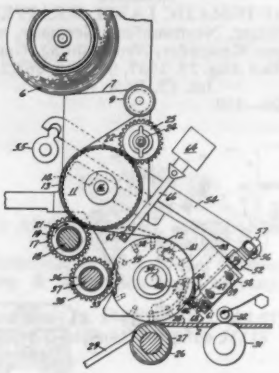
**3,586,586**

## TAPE APPLICATING AND SEVERING MEANS

**Jack V. Berg, 2501 Hudson Road, St. Paul, Minn. 55119**

**Continuation of application Ser. No. 587,814, Oct. 19, 1966. This application Dec. 15, 1969, Ser. No. 884,767**
**Int. Cl. B32b *31/18***
**U.S. Cl. 156—521** **12 Claims**



A tape dispensing device in which the tape is transported from a rest position to a dispensed position on the surface of a member to which it is attracted by a physical force and including stationary bridge means for lifting successive portions of the tape from the transport member intermediate the rest and dispensed positions as the tape is moved and means for severing the tape in the lifted area to permit dispensing of random lengths.

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**3,586,587**

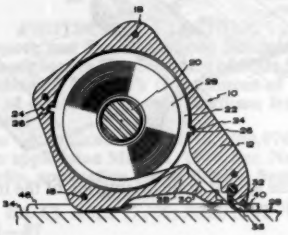
## TAPE APPLICATOR

**Elvin L. Boyce, Salt Lake City, Utah, assignor of fractional part interest to Paul J. Carpenter, Salt Lake City, Utah**

**Filed July 26, 1968, Ser. No. 747,861**
**Int. Cl. B32b *31/18, 31/20***
**U.S. Cl. 156—527** **11 Claims**

A tape applicator which includes a housing, means for rotatably mounting a roll of pressure sensitive tape in the

housing, a housing aperture for passing the free end of the tape from the housing to a work surface, a flexible applicator tongue affixed to the housing proximate the aperture, brake means mounted on the housing to brake the movement of the tape through the aperture, and a cutting



blade connected to the housing proximate the end of the flexible tongue. Registers can be provided on the housing for running the applicator against a straight edge and a a stepped aperture can be used for positioning the tape therein.

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**3,586,588**

**APPARATUS FOR THE MANUFACTURING OF LAMINATED MATERIAL**

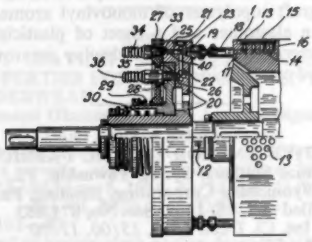
**Erik Solbeck, 342 Vedbaek Strandvej, 2950 Vedbaek, Denmark**

**Filed Nov. 4, 1968, Ser. No. 773,064**

**Claims priority, application Denmark, Nov. 2, 1967, 5,454/67**

**Int. Cl. B32b *31/06;* B65h *17/30***

**U.S. Cl. 156—553** **6 Claims**



A disc slide is mounted coaxially of the embossing roller and is composed of a disc and a cover. The disc is provided with nipples in connection with vacuum channels in the embossing roller while the cover is provided with channels and apertures to connect a vacuum source with the nipples. The cover includes two mutually rotatable discs which contain check valves which prevent loss of the vacuum upon bursting of a depression in the foil.

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**3,586,589**

**ULTRASONIC TOOL AND STAND**

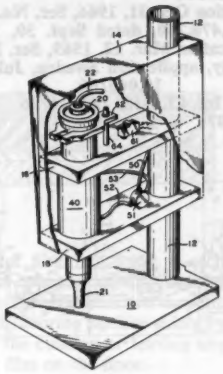
**John Jugler, Danbury, Conn., assignor to Branson Instruments Incorporated, Stamford, Conn.**

**Filed July 17, 1969, Ser. No. 842,518**

**Int. Cl. B30b *1/32;* B32b *31/16;* B29c *27/08***

**U.S. Cl. 156—580** **6 Claims**

An ultrasonic tool comprises a platform and an upstanding post for supporting the tool. The converter unit furnishing ultrasonic energy to a workpiece is housed within a cylindrical sleeve provided with a ring. The sleeve and ring enclosing the converter unit operate as a piston and are adapted to undergo, responsive to fluid pressure,



reciprocating motion within a substantially stationary sleeve.

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**3,586,590**

**PROCESS FOR WELDING TWO PIECES OF PLASTIC BY FRICTION OF ONE AGAINST THE OTHER AND APPARATUS FOR CARRYING OUT THIS PROCESS**

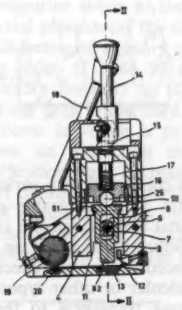
**Henri Brenneisen, Paris, France, assignor to FAM Forschungs-Anstalt fur Mechanik, Vaduz, Liechtenstein**

**Filed Oct. 24, 1967, Ser. No. 677,650**

**Claims priority, application Switzerland, Nov. 8, 1966, 16,099/66; May 19, 1967, 7,087/67; June 12, 1967, 8,288/67**

**Int. Cl. B29c *27/08;* B23k *1/06***

**U.S. Cl. 156—580** **3 Claims**



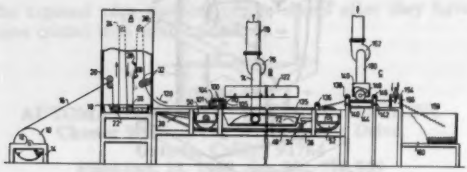
Process for welding two pieces of plastic by rubbing the pieces one against the other, in which one of the pieces is driven in a vibratory movement parallel to the other piece, and in which the two pieces being applied one against the other with a constant pressure during the entire duration of the vibratory movement. The duration of the vibratory movement is adjusted in proportion to the thickness of the piece to be welded, the frequency of the movement, and the pressure. Apparatus for carrying out this process includes an electric motor carrying an eccentric at the end of a shaft driving for vibrationally a metallic piece having a roughened face for engaging and moving one piece of plastic against the other.

3,586,591

## APPARATUS FOR THE PRODUCTION OF DIAGONALLY PLEATED PAPER MATERIAL

Carl Georg Munters, 3 Danderydsvagen, Stocksund, Sweden, and George W. Meek, P.O. Box 1909, Fort Myers, Fla. 33901

Original application Oct. 31, 1966, Ser. No. 590,919, now Patent No. 3,470,280, dated Sept. 30, 1969. Divided and this application Mar. 12, 1969, Ser. No. 839,100
Claims priority, application Sweden, July 22, 1966, 10,065/66
Int. Cl. B31f *1/20, 1/36*
U.S. Cl. 156—587 16 Claims



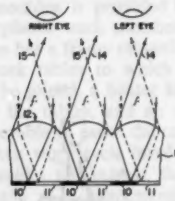
Apparatus for diagonally corrugating paper or like material in which a web of deformable material is fed into a mold which moves on a closed path and which has grooves extending diagonally across it.

3,586,592

## THREE DIMENSIONAL PICTURE

Leo Cahn, 30 Salem Way, Glen Head, N.Y. 11545

Continuation-in-part of applications Ser. No. 370,009, May 25, 1964, and Ser. No. 451,537, Apr. 28, 1965. This application Jan. 15, 1968, Ser. No. 698,023
Int. Cl. B44f *1/00*
U.S. Cl. 161—2 12 Claims




This invention is concerned with various forms of three dimensional pictures and changeable pictures in which the three dimensional and changeable effect is created by the use of two different views made up in alternate striations which are placed on curved reflecting mirrors without the use of lenticular or other types of lenses, and in which further curves transverse to the first mentioned curved reflecting mirrors are provided to enhance the brightness and viewability of the picture.

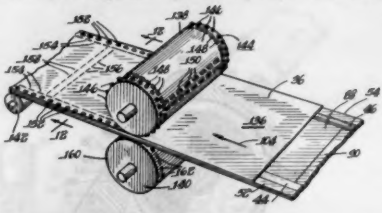
3,586,593

## MAGNETICALLY ACTUATABLE BUSINESS MACHINE CARD

Ernest A. Dahl, Jr., Wilmette, Ill. 60091

Original application Oct. 22, 1965, Ser. No. 501,794, now Patent No. 3,526,562, dated Sept. 1, 1970. Divided and this application Dec. 22, 1969, Ser. No. 886,842
Int. Cl. B32b *5/12, 29/00*; G06k *19/00*
U.S. Cl. 161—36 8 Claims

A magnetically actuatable business machine card of stable flatness including an intermediate lamina of non-magnetic and magnetic materials sandwiched between a pair of outer laminae having axes of grain orientation at



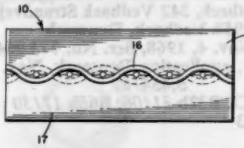
an angle to the axis of grain orientation of the intermediate non-magnetic material.

3,586,594

## COLD-FORMABLE METAL REINFORCED LAMINATE COMPRISING A POLYVINYL HALIDE SHEET BONDED TO A GUM PLASTIC SHEET

Thomas J. Stolki, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed June 10, 1969, Ser. No. 831,891
Int. Cl. B32b *3/24, 27/12, 27/30*
U.S. Cl. 161—39 6 Claims



Composites which utilize an interlayer of metal between a sheet of graft copolymer of monovinyl aromatic compound on an elastomer and a sheet of plasticized vinyl halide polymer. The composites display improved heat resistance and can be cold-formed.

3,586,595

## DECORATIVE ANCHOR ELASTIC FABRIC TAPE

Robert Thomas Spillane, Spring Township, Pa., assignor to Wyomissing Corporation, Reading, Pa.

Filed Oct. 28, 1969, Ser. No. 871,853
Int. Cl. D03d *13/0, 15/00, 17/00*
U.S. Cl. 161—77 6 Claims

A decorative anchor elastic fabric tape, particularly for use around the leg opening of a garment comprising a woven strip of fabric having a smooth face devoid of ornamentation on which is applied a series of beads of elastomeric material extending longitudinally of the tape in laterally spaced relation, the other surface of the tape having ornamentation in the form of both warpwise and fillingwise floats, the fabric having embedded therein elastomeric warp yarns which cause relaxation of the warpwise floats which therefore project outwardly from the ornamental face. The pattern effect produced by the warpwise floats of relaxed yarn is readily distinguishable from the pattern effect produced by the fillingwise floats of yarn which are not affected by the contractile forces of

the embedded elastic warps. The difference in pattern effects is amplified by the use of a textured yarn in the warpwise floats of the pattern which is capable of bulking upon relaxation, and the use of a non-textured lustrous yarn in the fillingwise floats. The different pattern effect is further enhanced when the fabric is dyed.

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3,586,596

## PROTECTIVE CLOTHING

Mark Ainsworth and James Anthony Butcher, Salisbury, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of application Ser. No. 580,076, Sept. 16, 1966. This application Mar. 11, 1970, Ser. No. 17,049
Claims priority, application Great Britain, Sept. 20, 1965, 40,059/65
Int. Cl. A62b *17/00;* B32b *5/16*
U.S. Cl. 161—87 8 Claims

Protective clothing is made of highly air-permeable cloth that has been treated with an oleophobic and hydrophobic compound and a lining of absorbent charcoal lying on the surface of the cloth inside the garment. The proportions of liquid repellent and charcoal applied to the cloth are sufficient to provide an effective barrier to the inward passage of corrosive or toxic chemicals—both liquids and gasses—from the outside but insufficient to reduce seriously the air permeability or to prevent the outward passage of the wearer's perspiration from the inside. The clothing material is made by first treating the highly permeable cloth with a known oleophobic and hydrophobic fluorocarbon compound; excess of this material is squeezed out and the treated cloth dried, and then a non-penetrating adhesive surface coating of a vehicle containing particles of activated charcoal is sprayed onto one side of the cloth. The clothing material may then be given a known fireproofing treatment. Such material and clothing is a protective barrier against corrosive or toxic sprays or mists in liquid or vaporised form.

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3,586,597

## CLOTH HAVING DURABLE ANTISTATIC PROPERTIES FOR USE IN GARMENTS AND UNDERWEAR

Tomomi Okuhashi, Tokyo, Japan, assignor to Teijin Limited, Osaka, Japan

No Drawing. Filed Nov. 18, 1968, Ser. No. 776,760
Claims priority, application Japan, Nov. 20, 1967, 42/74,600; Apr. 5, 1968, 43/22,506, 43/22,507
Int. Cl. B32b *5/16;* D06q *1/04*
U.S. Cl. 161—87 4 Claims

A knitted or woven cloth having durable antistatic properties for use in garments and underwear, said cloth containing about 0.005 to about 10% by weight of an electrically-conductive fiber, characterized in that said electrically-conductive fiber comprises a substrate of chemical fiber and an electrically-conductive coating formed thereon, said coating consisting of a binder polymer matrix having dispersed therein finely divided powder of an electrically conductive material sufficient to render the electrical resistance of the electrically-conductive fiber so as not to exceed about $10^9$ Ω/cm., and said electrically-conductive fiber having the functional properties of textile fibers.

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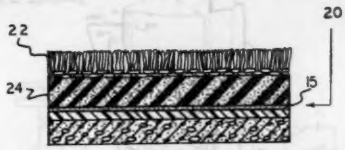
3,586,598

## CARPET FLOOR COVERING AND METHOD

Paul H. Beemer, Whittier, Calif., assignor to W. W. Henry Company, Huntington Park, Calif.

Filed Nov. 1, 1968, Ser. No. 772,589
Int. Cl. B32b *3/26;* D03d *27/00*
U.S. Cl. 161—160 14 Claims

A manually releasable assembly of adhesively-secured cushion-backed carpeting is disclosed. The substrate flooring if in a porous or rough condition is coated with a non-porous film former such as a sealer to form a smooth surface. After the sealer has dried, a controlled thickness layer of high-tear strength film-forming adhesive, such as one comprising natural latex, is applied to the floor. Before the adhesive film has dried, a section of low-tear strength cushion-backed carpeting is applied to the adhesive film. The film and attached carpeting can be parted from the smooth flooring surface solely by manual forces without tearing the cushion or leaving any of the cushion or the adhesive film on the floor.

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3,586,599

## PURIFICATION OF FLUFFED OR SHREDDED PULP WITH CHLORINE DIOXIDE

Frederic Harrison Yorston, Montreal, Quebec, and Norman Liebergott, Chomedy, Quebec, Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Quebec, Canada

Continuation-in-part of abandoned application Ser. No. 407,908, Oct. 30, 1964. This application Oct. 23, 1968, Ser. No. 769,879
Claims priority, application Canada, Aug. 7, 1964, 908,947
Int. Cl. D21c *9/14*
U.S. Cl. 162—67 11 Claims

A process for bleaching chemical pulp which comprises adjusting the moisture content of the pulp to a level from 60 to 80%, preferably 60 to 70%, shredding or fluffing the pulp into fibres and fibre aggregates and then adding chlorine dioxide gas diluted with a non-reactive gaseous diluent such as nitrogen or steam to the shredded fluffed pulp mass. The partial pressure of the chlorine dioxide is desirably of 100 millimeters of mercury or less, the bleaching time is of the order of 5 to 30 minutes, and the temperature is desirably from 65 to 100° C. When the process is used to treat pulp in the third stage of a multistage bleaching process in which a partially delignified pulp obtained from an extraction stage following a chlorination delignification stage is treated with the chlorine dioxide the pH of the pulp is controlled suitably by the incorporation of a buffering agent into the pulp before contact with chlorine dioxide such that the final pH of the pulp, before washing is in the range of 2 to 6.5.

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3,586,600

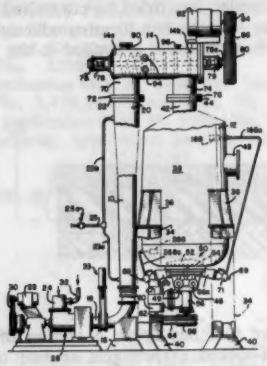
## CONTINUOUS DIGESTING APPARATUS

John P. Rich and Rohe V. Pennington, Nashua, N.H., assignors to Improved Machinery Inc., Nashua, N.H.

Filed July 27, 1967, Ser. No. 656,415
Int. Cl. D21c *7/00, 7/08*
U.S. Cl. 162—237 6 Claims

A continuous digesting apparatus particularly adapted for small particle size cellulosic material such as sawdust, comprising an impregnation vessel wherein the cellulosic material is first intermixed and impregnated with heated cooking liquor and thereafter heated by steam to a temperature below cooking temperature, a mixing vessel wherein the impregnated cellulosic material is agitated

and thence heated by steam to cooking temperature, and a cooking vessel wherein the the cook is performed. Also,



a method for digesting small particle size cellulosic material through the employment of this apparatus.

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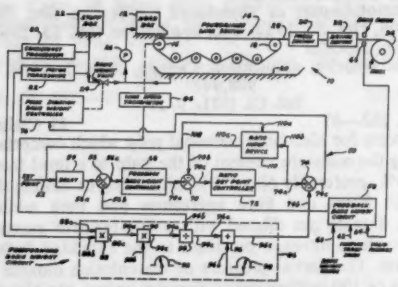
3,586,601

## BASIS WEIGHT CONTROL SYSTEM FOR A PAPER MAKING MACHINE

Spencer R. Persik, Jr., Beloit, Wis., Marion A. Keyes IV, South Beloit, Ill., and Douglas L. Bockstanz, Silsbee, Tex., assignors to Beloit Corporation, Beloit, Tex.

Filed Dec. 23, 1968, Ser. No. 786,009
Int. Cl. D21f *1/06*
U.S. Cl. 162—252 7 Claims



In order to produce a more accurate final basis weight at the reel or dry end of a paper making machine, the basis weight valve is adjusted via a feedforward control loop that provides a computed signal derived from measured heavy stock consistency, flow and Fourdrinier wire speed. Compensation, however, is made to the feedforward loop by a feedback control loop which furnishes a signal computed from the actual basis weight at the reel. When a grade change is to be made, the new set point signal representing the different grade is caused to temporarily bypass the feedback control so as to allow the feedforward loop to provide a rapid adjustment of the basis weight valve.

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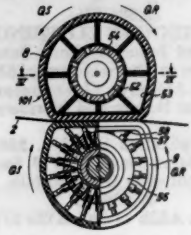
3,586,602

## APPARATUS FOR THE TRANSVERSE STRETCHING AND TRANSVERSE SHRINKING OF A CONTINUOUS WEB MATERIAL

Adolf Schmidt, 14 Nippesstrasse, Duren, Rhineland, Germany

Filed Oct. 19, 1967, Ser. No. 676,541
Claims priority, application Germany, Oct. 19, 1966, Sch 39,702
Int. Cl. D21f *3/09*
U.S. Cl. 162—359 17 Claims

An apparatus for transversely stretching or transversely shrinking a continuously movable material web, especially a paper web for treatment in a paper machine which includes a rotatable hose roller whose hose is held on its ends at the outer surface of two disks or the like which are adapted to be tilted toward each other in the sense of a change in width of the hose during its rotation and therewith in the sense of the desired transverse stretching or shrinking of the material web which is pressed by a counter surface against an area of the outer surface of



the hose roller whereby the hose roller including the disks or the like are either flattened off in a fixed circumferential area determined for the cooperation with the counter surface or are constructed so as to be elastically deformable in the radial direction, and the hose within the contact area with the material web is supported by way of the counter surface which may be a similar hose roller or cylinder, such as a drying cylinder.

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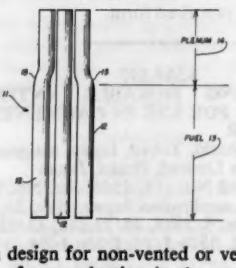
3,586,603

## NUCLEAR FUEL ROD HAVING AN OFFSET PLENUM

Douglas P. Hines, Saratoga, Calif., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 10, 1968, Ser. No. 766,431
Int. Cl. G21c *3/04, 3/21*
U.S. Cl. 176—68 5 Claims



A plenum design for non-vented or vented nuclear fuel which allows for a reduction in the core coolant pumping requirements from the conventional plenum configuration of fuel pins or rods. This is accomplished by offsetting the plenum region of the fuel pin and grouping several of the plena such that they nest together. The flow regions left between the small bundles of plena offer less resistance to flow and thus reduce the core pressure drop. The plenum configuration can be utilized in sodium-cooled, steam-cooled and gas-cooled reactors.

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3,586,604

## PHOSPHORYLATION OF NUCLEOSIDES BY FERMENTATION

Akio Yamanoi, Tokyo, and Teruo Shiro, Chigasaki-shi, Kanagawa-ken, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed June 7, 1968, Ser. No. 735,163
Claims priority, application Japan, June 16, 1967, 42/38,164
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 2 Claims

Inosine, guanosine, xanthosine, adenosine, and 5-amino-4-imidazolecarboxamide riboside can be phosphorylated

to the corresponding 5'-nucleotides by means of strains of Corynebacterium in otherwise conventional aqueous culture media containing inorganic phosphates.

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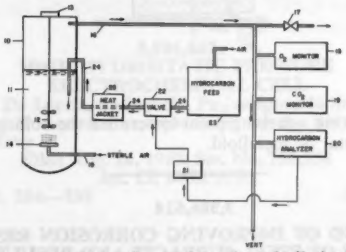
3,586,605

## METHOD FOR CONTROLLING HYDROCARBON FERMENTATIONS AND APPARATUS THEREFOR

Peter Hosler, Wallingford, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Filed June 18, 1968, Ser. No. 737,991
Int. Cl. C12b 1/00
U.S. Cl. 195—28 6 Claims




The concentration of a moderately volatile hydrocarbon substrate in a fermentation medium can be readily determined and said concentration maintained at a predetermined level by monitoring the vapor concentration of said hydrocarbon in the fermentation exhaust gases and controlling the introduction of additional substrate into the fermentation medium based on the amount of said vapor content. This can advantageously be carried out in a continuous manner by automated instrumentation.

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3,586,606

## PROCESS FOR PRODUCING 9-β-D-RIBOFURANOSIDE - 5' - PHOSPHORIC ACID ESTERS OF 2-SUBSTITUTED-6-HYDROXYPURINES

Kiyoshi Nakayama, Sagamihara-shi, Haruo Tanaka, Machida-shi, and Hiroshi Hagino, Hachioji-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Filed Oct. 8, 1968, Ser. No. 765,989
Claims priority, application Japan, Oct. 13, 1967, 42/65,426
Int. Cl. C12c 13/06
U.S. Cl. 195—28 10 Claims

A process for producing ribotides of 2-substituted-6-hydroxypurines by fermentation. Specifically, the products are 9-β-D-ribofuranoside-5'-phosphoric acid esters of said hydroxypurines. They are useful as model substances of RNA and as structural analogs of nucleotides constituting nucleic acid. The sodium salts thereof are good flavor enhancers. They are produced by culturing a microorganism in a nutrient medium containing the 2-substituted-6-hydroxypurines as additives.

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3,586,607

## PROCESS FOR THE RECOVERY AND PURIFICATION OF LYSOZYME

Aurelio Filippo Notarianni and Giuseppe Ghielmetti, Milan, Italy, assignors to SPA-Societa Prodotti Antibiotici S.p.A., Milan, Italy

No Drawing. Filed May 3, 1968, Ser. No. 726,599
Claims priority, application Great Britain, May 9, 1967, 21,434/67
Int. Cl. C07g 7/026
U.S. Cl. 195—66 6 Claims

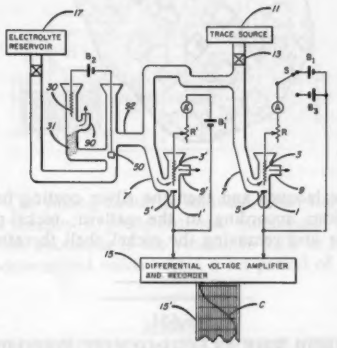
There is described a process for the purification and recovery of lysozyme, wherein a lysozyme-containing material is contacted with a carboxyalkyl-cellulose, the carboxyalkyl cellulose separated and the lysozyme absorbed thereon subsequently eluted.

3,586,608

## METHOD OF AND APPARATUS FOR THE DETECTION OF TRACES OF CHEMICAL AGENTS

Walter Juda, Lexington, and Martin S. Frant, Newton, Mass., assignors to Prototech Incorporated, Cambridge, Mass.

Filed Feb. 10, 1965, Ser. No. 431,675
Int. Cl. G01n 27/46
U.S. Cl. 204—1 12 Claims




This disclosure deals with the detection of intermediate and high molecular weight organic compounds in aqueous electrolytic solutions, as well as other traces of chemical agents, through measurement of the rate of variation in overvoltage at one electrode in an electrolyzing circuit.

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3,586,609

## METHOD FOR MAKING A CYLINDRICAL METALLIC DESIGNED STENCIL

Lodewijk Jansen, St. Anthonis, Netherlands, assignor to Stork Amsterdam N.V., Amsterdam, Netherlands

Filed July 26, 1968, Ser. No. 747,990
Claims priority, application Netherlands, July 28, 1967, 6710443, 6710444
Int. Cl. C23b 7/00; B01k 1/00
U.S. Cl. 204—11 3 Claims

A base in the form of an electircally conductive cylinder is provided with a screen of electrically insulated spots to form a desired pattern. Through an electrochemical process, a metallic layer of the desired thickness is deposited upon the base but the spots remain uncovered with metal. The outer diameter of the base cylinder is reduced to facilitate the removal of the metal layer therefrom. The metal layer will be the designed stencil.

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3,586,610

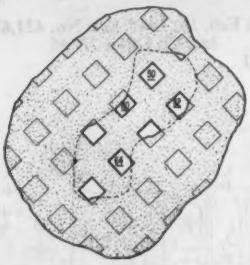
## METHOD OF MAKING A PRINTING PLATE FROM A SCREENLESS PATTERN

Christoph J. A. Peter, Glanebrug, Netherlands, and Peter Wilhelm Patze, Leipziger Ring 39, Niederroden, Germany

Filed Sept. 26, 1968, Ser. No. 762,761
Claims priority, application Germany, Sept. 26, 1967, P 16 11 181.2
Int. Cl. C23b 7/00; B41c 1/14; B41n 1/24
U.S. Cl. 204—11 9 Claims

A printing plate is made in the following steps: filling the screen-like arranged depressions of a metal cylinder

with an electrically insulating material, coating the entire cylinder with silver and then with a copying lacquer; reproducing the pattern on the lacquer; removing portions of the lacquer and then the silver coating beneath those portions according to the pattern; nickel-plating the cylinder and removing the nickel shell therefrom.



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3,586,611

## PROCESS FOR THE ELECTROLYTIC DEPOSITION OF GOLD-COPPER-CADMIUM ALLOYS

Gerhard Heilmann, Pforzheim, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed May 20, 1969, Ser. No. 826,280

Claims priority, application Germany, June 28, 1968, P 17 71 712.3

Int. Cl. C23b 5/42

U.S. Cl. 204—44 2 Claims

The electrolytic deposition of gold-copper-cadmium alloys according to Heilmann U.S. Pat. 3,056,733 is improved by including small amounts of silver in the aqueous alkaline cyanide bath.

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3,586,612

## ANODIC PHOSPHATING OF METALLIC ARTICLES

Kummattithidal S. Rajagopalan, Balasubramanya Dandapani, Anathakrishnan Jeyaraman, and Chakravarti Rajagopal, Karaikudi, India, assignors to Council of Scientific and Industrial Research, New Delhi, India

No Drawing. Filed Mar. 27, 1969, Ser. No. 811,243

Int. Cl. C23b 11/00

U.S. Cl. 204—56R 9 Claims

A metallic article is immersed in sodium phosphate solution as the positive electrode and, maintaining the potential in the range of −0.4 v. to +0.2 v., a pH of 3–5.5, and the cell current in the range of 0.9 a./sq. ft. to 22.5 a./sq. ft., a heavy coating is produced.

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3,586,613

## ELECTROLYTIC REDUCTION OF OXIDES USING PLASMA ELECTRODES

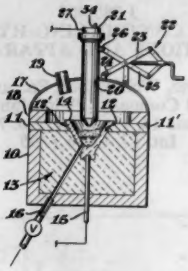
Russell L. Stewart, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 31, 1967, Ser. No. 627,436

Int. Cl. C22d 3/00, 3/12

U.S. Cl. 204—67 10 Claims

A method of reducing oxides of metals and metalloids using a gaseous plasma which forms an ionized gas anode as part of the electrolytic cell. The invention is applicable for the production of metals and metalloids which form oxides having a melting point lower than the boiling point of the metal or metalloid.



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3,586,614

## METHOD OF IMPROVING CORROSION RESISTANCE OF STEEL SURFACES AND RESULTING PRODUCT

William E. Boggs, Monroeville Borough, and Robert H. Kachik, Washington Township, Westmoreland County, Pa., assignors to United States Steel Corporation

No Drawing. Filed May 31, 1968, Ser. No. 733,307

Int. Cl. C22f 13/00

U.S. Cl. 204—148 3 Claims

Method of increasing corrosion resistance of steel surface in which the surface is coated with aluminum, and a film of mixed oxides of silicon and aluminum is deposited over the aluminum-coated surface.

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3,586,615

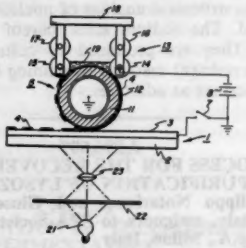
## PHOTOELECTROPHORETIC IMAGING PROCESS INCLUDING THE USE OF AN ELECTRICALLY CHARGED SUSPENSION COATING MEANS

Leonard M. Carreira, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Jan. 2, 1969, Ser. No. 789,088

Int. Cl. G03g 13/22

U.S. Cl. 204—181 3 Claims



It has been determined that by applying DC voltage to a coating means in the electrophoretic imaging system that it is possible to establish the necessary field for imaging as well as eliminating the buildup of unwanted residual charge on the surface of the blocking electrode. In addition, the application of the potential in this manner has been found to decrease mottling of the imaging suspension on the surface of the blocking electrode.

3,586,616

## BIS(PERFLUOROALKYLSULFONYL)METHANE METAL SALTS IN CATIONIC POLYMERIZATION

James E. Kropp, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Mar. 14, 1969, Ser. No. 807,407
Int. Cl. B01j 1/10, 1/12; C08f 1/16
U.S. Cl. 204—159.11 12 Claims

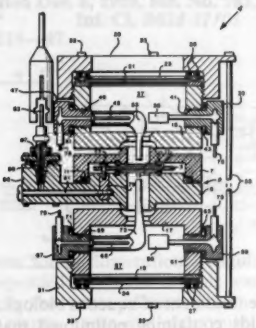
Bis(perfluoroalkylsulfonyl)methane metal salts are used as latent catalysts in the curing or polymerization of cationic sensitive monomers, such as epoxides, vinyl ethers, N-vinyl compounds, aziridines, and acetals.

3,586,617

## HIGH HYDROSTATIC PRESSURE ELECTROCHEMICAL CELL

John J. De Luccia, Springfield, Pa., assignor to the United States of America as represented by the Secretary of the Navy

Filed Aug. 26, 1968, Ser. No. 755,354
Int. Cl. B01k 3/00
U.S. Cl. 204—195 4 Claims



The present invention relates to novel and improved apparatus for evaluating the electrochemical and diffusion parameters of hydrogen through a metallic specimen. The improved apparatus contemplates use of a hydrogen permeation cell that is subdivided into a pair of electrolytic cells by the metallic specimen itself. In one electrolytic cell, one surface of the specimen is used as a cathode on which a controlled supply of hydrogen is evolved. In the other electrolytic cell, the other surface of the specimen is used as an anode on which hydroxyl ions are present for combination with hydrogen that permeates the specimen. Load current in the anodic cell indicates the permeation rate of hydrogen through the specimen. This process is performed in a controlled temperature and hydrostatic pressure environment which is transmitted to the permeation cell through a timpanic membrane in the structural wall of each component electrolytic cell.

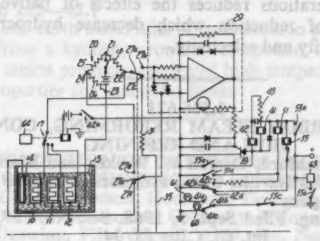
3,586,618

## THIN FILM RESISTOR ANODIZING AND MONITORING CIRCUIT

William S. Burns, Jr., Shreveport, La., and James L. Owens, Clemmons, and George A. Patton, Pfafftown, N.C., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 5, 1968, Ser. No. 703,104
Int. Cl. B01k 3/00
U.S. Cl. 204—228 3 Claims

An anodizing and monitoring circuit alternatively applies an anodizing voltage to a thin film resistor and monitors the resistance to increase the resistance to a desired value. The anodizing voltage is continually increased during the anodizing and monitoring until the anodizing is terminated by the resistance increasing to a predetermined value or by the operation of a timing



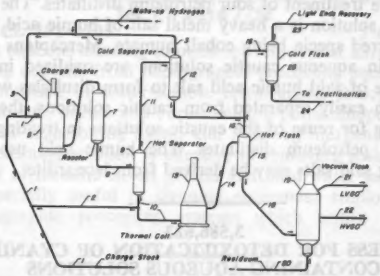
circuit. The timing circuit is initiated when the anodizing voltage reaches a predetermined magnitude for terminating the anodizing if the resistance fails to increase to the predetermined value within a set period of time.

3,586,619

## CONVERSION AND DESULFURIZATION OF HYDROCARBONACEOUS BLACK OILS

Laurence O. Stine, Western Springs, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 28, 1968, Ser. No. 771,251
Int. Cl. C10g 37/04
U.S. Cl. 208—89 5 Claims




A process for converting hydrocarbonaceous black oils into lower-boiling, normally liquid hydrocarbon products. The process involves the integration of hydrogenative cracking and fixed-bed catalytic desulfurization, and is especially applicable to those hydrocarbon charge stocks containing less than 150 p.p.m. of metallic contaminants, and more than about 10.0% by volume non-distillables. The charge stock is initially subjected to a fixed-bed catalytic hydrogenation and desulfurization reaction zone. Following separation of the reaction zone effluent, a high-boiling concentrate is thermally cracked in a hydrovisbreaking operation.

3,586,620

## METHOD OF ACTIVATING A HYDROCRACKING CATALYST

Algie J. Conner, Downers Grove, and Frank H. Adams, Riverside, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Feb. 13, 1969, Ser. No. 799,100
Int. Cl. C10g 13/00
U.S. Cl. 208—111 22 Claims

A hydrocracking catalyst in an oxidized state is activated by a method which gives a superior performing

hydrocracking catalyst. The hydrocracking catalyst is reduced and sulfided by a procedure which allows a liquid hydrocarbon stream to be in contact with the hydrocracking catalyst during reduction and sulfiding. The presence of the liquid hydrocarbon stream during reduction and sulfiding operations reduces the effects of native water and water of reduction which decrease hydrocracking catalyst activity and selectivity.

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3,586,621

## HYDROCARBON STEAM REFORMING, CONVERSION AND REFINING

Armin C. Pitchford, Darrell W. Walker, and Marvin M. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Sept. 3, 1968, Ser. No. 757,113
Int. Cl. C10g *13/04*
U.S. Cl. 208—112 3 Claims

Heavy hydrocarbon oils, residual fractions and other carbonaceous materials are converted to useful liquid products by contacting with a nickel spinel catalyst promoted with a barium salt of an organic acid.

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3,586,622

## SWEETENING PETROLEUM DISTILLATES WITH HUMIC ACID SALTS

Ralph B. Thompson, Oak Brook, Ill., assignor to Howe-Baker Engineers, Inc., Tyler, Tex.

No Drawing. Continuation of application Ser. No. 658,031, Aug. 3, 1967. This application Jan. 5, 1970, Ser. No. 503
Int. Cl. C10g *19/02, 27/06, 29/14*
U.S. Cl. 208—204 4 Claims

Catalyzed aqueous alkaline solutions are utilized in an oxidative treatment of sour petroleum distillates. The catalyst in solution is a heavy metal salt of humic acid with a preferred specie being cobalt humate. Mercaptans contained in aqueous caustic solutions are oxidized in the presence of said humic acid salt to form disulfides which are then easily separated from caustic solutions, thereby allowing for reuse of the caustic solutions in treating additional petroleum distillates. The humic acid used in forming said salts may be derived from leonardite.

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3,586,623

## PROCESS FOR DETOXIFICATION OF CYANIDE CONTAINING AQUEOUS SOLUTIONS

Rudolf G. Kuhn, Koppern, Germany, assignor to Deutsch Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed Nov. 18, 1968, Ser. No. 776,755
Claims priority, application Germany, Jan. 12, 1968, P 16 42 400.3
Int. Cl. C02c *5/04*
U.S. Cl. 210—63 4 Claims

Aqueous cyanide solutions are detoxified by contacting them with air in the presence of a contact catalyst, preferably activated carbon.

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3,586,624

## WASTE DISPOSAL METHOD AND SYSTEM

Gordon P. Larson, Malvern, Pa., assignor to Warner Company, Philadelphia, Pa.

Filed Mar. 2, 1970, Ser. No. 23,331
Int. Cl. C02c *5/10*
U.S. Cl. 210—3 27 Claims

A landfill in which an earth sub-base is formed in a land area and the sub-base is covered with a liquid impervious layer. All of the solid waste fill in successive layers is placed on the impervious layer. Water flowing through the landfill becomes contaminated by the solid waste, is collected by the impervious layers and is then drained off the landfill and treated. The treated water and if not available, water from an external source, is distributed on the landfill which together with natural precipitation produces substantially continuous flow of water

through the landfill thereby to accelerate the decomposition reaction of the solid waste.

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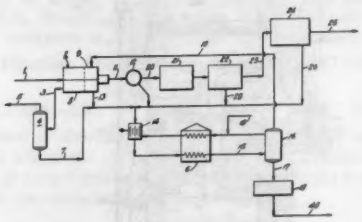
3,586,625

## TREATMENT OF AQUEOUS STREAMS FOR REMOVAL OF NITROGEN AND PHOSPHORUS COMPOUNDS

Edward L. Cole and Raymond F. Wilson, Fishkill, and Howard V. Hess, Glenham, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 12, 1969, Ser. No. 884,431
Int. Cl. C02c *1/02*
U.S. Cl. 210—16 3 Claims



A process for the treatment of aqueous biological wastes and/or other liquids containing pollutional materials to produce an effluent having a low COD (BOD) and a substantially reduced concentration of soluble nitrogen and phosphorus compounds wherein a waste water stream is fed to a coking zone and heated to a temperature in the range of 400 to 700° F. under sufficient pressure to prevent the vaporization of water to form coke, carbon dioxide, and low molecular weight oxygenated organic compounds which are separated from the treated sewage aqueous effluent; this effluent is oxidized with air at a temperature above about 450° F. under sufficient pressure to prevent the vaporization of water and either the carbon dioxide or the oxygenated organic compounds or both are introduced at selected points in the waste water stream to stimulate the growth of microorganisms which consume soluble nitrogen and phosphorus compounds, which microorganisms are then sent on to the coking zone for coking. By thus stimulating biological processes which consume nitrogen and phosphorus compounds there is produced an effluent which can be discharged into bodies of water without causing eutrophication of the waters.

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3,586,626

## GEL CHROMATOGRAPHY PROCESS

Walter Heitz, Wiesbaden-Kostheim, and Karl-Ludwig Platt and Werner Kern, Mainz, Germany, assignors to E. Merck AG, Darmstadt, Germany

No Drawing. Filed Mar. 27, 1967, Ser. No. 625,947
Claims priority, application Germany, Mar. 31, 1966, M 68,996
Int. Cl. B01d *15/08*
U.S. Cl. 210—31 9 Claims

Novel chromatographic gels are produced by copolymerization, with simultaneous or subsequent cross-linking,

of vinyl esters or vinylene carbonates containing up to 20 carbon atoms with one or more cross-linkable vinyl compounds such as divinyl or diallyl esters of dicarboxylic acids, epoxy compounds, divinyl ethers of alkane diols and other well-known cross-linkable vinyl compounds. The resultant gels can be partially or completely saponified and then employed in the separation of substances with varying molecular weights employing known chromatographic techniques.

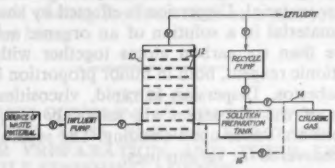
## ERRATUM

For Class 210—045 see:
Patent No. 3,586,657

## 3,586,627
## PROCESS FOR AGGLOMERATING AND COAGULATING WASTE MATERIAL

**Jan W. Gooch, Russellville, Ark., assignor of fractional part interest to Paul P. Paladino and Luther A. Combs, doing business as Sea-Met, Russellville, Ark.**

**Continuation-in-part of abandoned application Ser. No. 757,224, Aug. 30, 1968, which is a continuation-in-part of application Ser. No. 696,537, Jan. 9, 1968. This application Dec. 6, 1968, Ser. No. 781,840**
**Int. Cl. B01d *21/01***
**U.S. Cl. 210—47** **15 Claims**




A process for agglomeration, coagulation and extraction of suspended solids and organic waste materials such as found in the waste effluent streams of packing and rendering plants, paper and pulp mills, food processing plants, and similar facilities. In one embodiment of the invention, the process comprises introducing a reagent solution into the waste stream in such a manner that the reagent is released within the waste stream in the form of a microscopically dispersed gaseous phase which is selectively adsorbed on the surfaces of the suspended solids and organic waste materials to selectively react with the surfaces of the solids and materials and produce surface characteristics which induce agglomeration and coagulation of the solids and materials. A second embodiment comprises electrolytically generating the microscopically dispersed gaseous phase reagent within the waste streams.

## 3,586,628
## DRILLING FLUID

**Jack H. Kolnian, Houston, Tex.**
**(% Texaco, Inc., P.O. Box 425, Bellaire, Tex. 77401)**

**No Drawing. Filed Apr. 25, 1967, Ser. No. 633,434**
**Int. Cl. C10m *3/26, 3/24, 3/14***
**U.S. Cl. 252—8.5** **14 Claims**

An aqueous drilling fluid dispersant and a method of drilling wells using said drilling fluid which contains a substituted dihydroxybenzene compound as the dispersant, namely, an alkyl substituted dihydroxybenzene such as 4-methyl-, 4-ethyl-, 4-isopropyl-, 4-tertiarybutyl-, 4-hexyl-, 4-octyl-1,2-dihydroxybenzene, a substituted benzene such as 4-nitro-, 4-chloro-, 4-hydroxy-, 4-formyl-, 4-carboxy-, 4-(2'-carboxyethenyl)-, and 4-methyl-5-chloro-1,2 - dihydroxybenzene, 2,5-dihydroxy-1,4-benzoquinone, 2,5-dihydroxy-3,6-dichloro-1,4-benzoquinone, the quinoid tautomers, 4,5 - dihydroxy-1,2-benzoquinone, 4,5-dihydroxy-3,6-dichloro-1,2-benzoquinone, and mixtures of these compounds.

## 3,586,629
## METAL SALTS AS LUBRICANT ADDITIVES

**Ferdinand P. Otto, Woodbury, and Frederick C. Frank, Glassboro, N.J., assignors to Mobil Oil Corporation**

**No Drawing. Filed Sept. 16, 1968, Ser. No. 760,089**
**Int. Cl. C10m *1/34, 1/32***
**U.S. Cl. 252—42.7** **11 Claims**

Alkaline earth metal salts of condensation products prepared from a hydroxy aromatic compound, an aldehyde and an amine produces improved high temperature detergent properties for industrial fluids.

## 3,586,630
## STABILIZATION OF CHROMIUM DIOXIDE BY ORGANOPHOSPHORUS COMPOUNDS

**Henry Gilbert Ingersoll, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed May 8, 1969, Ser. No. 823,137**
**Int. Cl. H01f *1/28***
**U.S. Cl. 252—62.54** **10 Claims**

Organophosphorous compounds taken from the group consisting of phosphines, phosphine oxides, and phosphorus esters, wherein no —OH group is atttached directly to a P atom, admixed in stabilizing amounts with $CrO_2$ particles and incorporated with a polymer binder thereby retarding loss of residual intrinsic flux density in magnetic recording members containing the ferromagnetic $CrO_2$ compositions.

## 3,586,631
## CLEANING SOLUTION FOR REMOVING SILVER-CONTAINING DEPOSITS FROM PHOTOGRAPHIC PROCESSING EQUIPMENT

**Henry J. Fassbender, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**No Drawing. Filed Sept. 25, 1969, Ser. No. 861,171**
**Int. Cl. C11d *7/54***
**U.S. Cl. 252—103** **7 Claims**

An aqueous cleaning solution for removal of silver-containing deposits from photographic processing equipment is comprised of water-soluble ferricyanide, thiocyanate, dichromate, nitrate and citrate salts, a polyaminopolyacetic acid sequestering agent, and a strong inorganic base. The cleaning solution is effective in removing scale comprised of metallic silver, gelatin and hard water salts and is especially useful in cleaning equipment employed in photographic processing systems which utilize monobaths.

## 3,586,632
## CLEANING COMPOSITIONS CONTAINING CURD DISPERSANTS

**Gordon Trent Hewitt, Upper Montclair, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.**

**No Drawing. Filed May 29, 1969, Ser. No. 829,118**
**Int. Cl. C11d *9/30, 15/04***
**U.S. Cl. 252—117** **6 Claims**

This disclosure relates to fatty acid soap-based cleaning preparations containing an N,N dimethyl higher alkyl sulfonamide as a curd dispersant.

## 3,586,633
## ALKALINE CLEANSING AGENT

**Hans-Joachim Schlussler, Dusseldorf-Holthausen, Germany, assignor to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany**

**No Drawing. Continuation of application Ser. No. 510,961, Dec. 1, 1965. This application Apr. 3, 1969, Ser. No. 816,154**
**Claims priority, application Germany, Apr. 1, 1965, H 55,665**
**Int. Cl. C11d *3/06***
**U.S. Cl. 252—137** **5 Claims**

Alkaline cleansing agents containing additives which prevent hydrolysis and the deposit of calcium compounds due to the use of hard water. The additives are present in quantities ranging from 0.5 to 20 weight percent and

are a mixture of a hydroxyalkane-1,1-diphosphonic acid with an aminopolyphosphonic acid in mutual weight proportions of 3:1 to 1:3. The water-soluble salts of both these compounds may be used in lieu of the acids themselves.

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3,586,634

## ALKALI URANYL PHOSPHATE PHOSPHORS COACTIVATED WITH RARE EARTHS

**Frank J. Avella, Flushing, N.Y., assignor to General Telephone & Electronics Laboratories Incorporated**

**No Drawing. Filed Feb. 19, 1968, Ser. No. 706,662**
**Int. Cl. C09k *1/30***
**U.S. Cl. 252—301.1** **10 Claims**

Condensed alkali uranyl phosphate phosphors coactivated with rare earth ions wherein the alkali metals are chosen from the group lithium, sodium, potassium, rubidium and cesium and the rare earth coactivators are chosen from the group europium, samarium and neodymium. These phosphors, when excited by ultraviolet, electron, ion or X-ray radiation, exhibit dominant emission colors which may be varied from green to red through white depending upon the coactivator selected and the molar concentrations. The phosphors, may be utilized as color correctors for mercury lamps, in cathode ray tube screens including screens for color television tubes, and in detectors for ion or X-ray beams.

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3,586,635

## PROCESS FOR THE PREPARATION OF METAL SILICATE PHOSPHORS

**Milton C. Vanik, Severna Park, and Robert W. McKinney, Adelphi, Md., assignors to W. R. Grace & Co., New York, N.Y.**

**No Drawing. Filed May 2, 1968, Ser. No. 726,207**
**Int. Cl. C09k *1/54***
**U.S. Cl. 252—301.6F** **6 Claims**

Calcium metal silicate and zinc orthosilicate phosphors are produced using a continuous homogeneous precipitation technique. Precipitation of a reactive hydrous oxide intermediate under intensive mixing conditions, followed by spray drying, washing, drying and calcination yields the desired fluorescent material.

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3,586,636

## EUROPIUM ACTIVATED VANADATE PHOSPHORS WITH TANTALUM AND/OR NIOBIUM ADDITIVE

**Tsuyoshi Kano, Higashimurayama-shi, and Yoshiro Otomo, Mitaka-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Nov. 25, 1968, Ser. No. 778,700**
**Claims priority, application Japan, Nov. 27, 1967, 42/75,668**
**Int. Cl. C09k *1/44***
**U.S. Cl. 252—301.4R** **7 Claims**

Europium activated yttrium, gadolinium and yttrium-gadolinium vanadate phosphors are doped with Ta, Nb, or either Ta, Nb, or Ta-Nb optionally with Si, and are useful as red color-emitting phosphor for high-pressure mercury lamps.

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3,586,637

## EUROPIUM ACTIVATED BARIUM AND STRONTIUM BOROPHOSPHATE LUMINESCENT MATERIAL

**George Blasse and Jaap de Vries, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed June 18, 1969, Ser. No. 834,285**
**Claims priority, application Netherlands, June 22, 1968, 6808846**
**Int. Cl. C09k *1/36, 1/66***
**U.S. Cl. 252—301.4** **4 Claims**

Luminescent material for a low-pressure mercury vapor lamp consisting essentially of a europium activated strontium or barium boro-phosphate.

3,586,638

## CATALYST SYSTEM COMPRISING AND ORGANOALUMINUM OR ORGANOZINC AND A METAL SALT OF A BETA-DIKETONE

**Henry L. Hsieh, Bartlesville, Okla., assignor to Phillips Petroleum Company**

**No Drawing. Original application June 7, 1965, Ser. No. 462,121, now Patent No. 3,468,860, dated Sept. 23, 1969. Divided and this application Feb. 20, 1969, Ser. No. 801,181**
**Int. Cl. C08g *23/14***
**U.S. Cl. 252—431** **5 Claims**

A polymerization catalyst comprising (a) an organometallic compound selected from the group consisting of organoaluminum and organozinc compounds and (b) a metal salt of a beta-diketone wherein the metal is selected from Groups II–A, I–B, II–B, III–B, or IV–B of the Periodic Table.

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3,586,639

## DISPERSION OF ASBESTOS

**Roy F. House, Houston, Tex., assignor to National Lead Company, New York, N.Y.**

**No Drawing. Filed Mar. 8, 1967, Ser. No. 621,464**
**Int. Cl. B01j *13/00*; C03b *37/00***
**U.S. Cl. 252—313** **10 Claims**

A process is disclosed whereby chrysotile and tremolite can be dispersed, in aqueous suspension, into the individual sub-microscopic fibrils comprising the aggregates of the raw material. Dispersion is effected by shearing the starting material in a solution of an organic acid having not more than six carbon atoms together with a long-chain cationic reagent, both in minor proportion by weight to the asbestos. Dispersion is rapid, viscosities and gel strengths of the dispersion are relatively low, and the dispersions are stable upon standing. The separated fibrils may be recovered for various uses.

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3,586,640

## FAR-INFRARED PHOTODETECTOR

**Peter S. Pershan, Lexington, and Peter Eisenberger, Brighton, Mass., assignors to the United States of America as represented by the Secretary of the Navy**

**No Drawing. Filed Apr. 24, 1968, Ser. No. 723,876**
**Int. Cl. G03g *5/00*; H01l *13/00***
**U.S. Cl. 252—501R** **1 Claim**

A new class of semiconductor photodetectors are fabricated by doping ionic single crystals with rare-earth dopants. When these doped crystals are cooled and a potential is applied across the crystal, it functions as an image converter, converting incident infrared radiation into visible components.

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3,586,641

## ENHANCEMENT OF SUPERCONDUCTIVITY OF LANTHANUM AND YTTRIUM SESQUICARBIDE

**Milton C. Krupka, Angelo L. Giorgi, Nerses H. Krikorian, and Eugene G. Szklarz, Los Alamos, N. Mex., assignors to the United States of America as represented by the United States Atomic Energy Commission**

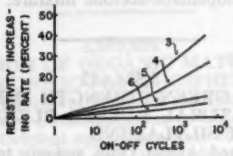
**No Drawing. Filed July 18, 1969, Ser. No. 843,224**
**Int. Cl. C01b *31/30*; H01b *1/00*; H01v *11/12***
**U.S. Cl. 252—516** **3 Claims**

A method of enhancing the superconductivity of body-centered cubic lanthanum and yttrium sesquicarbide through formation of the sesquicarbides from ternary alloys of novel composition $(N_xM_{1-x})C_z$, where N is yttrium or lanthanum, M is thorium, any of the Group IV and VI transition metals, or gold, germanium or silicon, and $z$ is approximately 1.2 to 1.6. These ternary sesquicarbides have superconducting transition temperatures as high as 17.0° K.

## 3,586,642
## PTC THERMISTOR OF $BaTiO_3$, AND OTHER OXIDES

Yoshihiro Matsuo, Eisuke Kurokawa, Hiromu Sasaki, and Shigeru Hayakawa, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 22, 1968, Ser. No. 769,681
Claims priority, application Japan, May 29, 1968, 43/37,425
Int. Cl. H01b *1/06*; C04b *33/00*
U.S. Cl. 252—520 6 Claims




A PTC thermistor composition consisting of $BaTiO_3$, $Al_2O_3$, $SiO_2$, $TiO_2$, and one oxide selected from the group consisting of $Nb_2O_5$, $Ta_2O_5$, $Sb_2O_3$, $Bi_2O_3$, $La_2O_3$, $CeO_2$, $Gd_2O_3$, $Sm_2O_3$ and $Y_2O_3$, and a method of producing ceramic body for said PTC thermistor comprising mixing the constituents, calcining, pressing the calcined mixture into disks, firing the disks at 1240 to 1400° C. for 0.5 to 5 hours, and cooling the fired disks at a rate lower than 150° C. per hour.

## 3,586,643
## FLUORINE CONTAINING POLY-N-VINYL CARBOXYLIC ACID AMIDES, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS TEXTILE FINISHING AGENTS

Helmut Hahn, Burghausen, Salzach, Klaus-Dieter Müller, Kelkheim, Taunus, Siegfried Rebsdat, Altotting, and Erich Schuierer, Burghausen, Salzach, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed June 25, 1969, Ser. No. 836,664
Claims priority, application Germany, July 4, 1968, P 17 70 795.8; Oct. 17, 1968, P 18 03 581.9
Int. Cl. C08g *33/02*
U.S. Cl. 260—2 19 Claims

Polymers containing recurring units of the formula

$$\left[\begin{array}{l}-CH-CH_2- \\ \quad | \\ NH-CO-CXY-R_f\end{array}\right]$$

in which $R_f$ is perfluoroalkyl of 3 to 10 carbon atoms, and X and Y are fluorine and/or hydrogen, are useful as agents for rendering fibrous materials water and oil repellent. The lower oligomers are soluble in low volatile fluorinated hydrocarbons. The polymers are soluble in acetone and capable of forming aqueous dispersions.

## 3,586,644
## ION EXCHANGERS FROM AROMATIC HYDROCARBON POLYMER BY REACTION WITH SULFUR HALIDE FOLLOWED BY OXIDATION OR REDUCTION

Geert Jan de Jong, Boekelo, Netherlands, assignor to N.V. Octrooien Maatschappij "Activit," Amsterdam, Netherlands

No Drawing. Filed Apr. 15, 1969, Ser. No. 816,378
Claims priority, application Netherlands, Apr. 16, 1968, 6805305
Int. Cl. C08f *27/06*
U.S. Cl. 260—2.2 19 Claims

In the production of ion exchange resins, a vinyl aromatic hydrocarbon polymer, preferably a copolymer of styrene and divinylbenzene, is reacted with sulphur halide, such as sulphurmonochloride, so that there is introduced into at least 30% of the aromatic nuclei more than one active group for each nucleus, and the product thus formed is oxidised to provide a strongly acid cation exchanger or reduced to porvide a thiol resin or ion exchanger of the SH type.

## 3,586,645
## THERMOPLASTIC CELLULAR MATERIAL PROCESSES AND PRODUCTS

Theodore A. Granger, Henderson, and Claude R. Nichols, Jr., Durham, N.C., assignors to Syndetic Research Associates, Inc., Durham, N.C.

Filed Aug. 20, 1964, Ser. No. 390,856
Int. Cl. C08f *47/00*; B29d *27/00*; C08g *53/10*
U.S. Cl. 260—2.5 25 Claims

Cellular thermoplastic materials are prepared by heating the material to plasticity, applying a pressure thereto, ejecting the material under pressure through an orifice to form a multiplicity of discreet particles and coalescing the particles while in the initial expanding state. The product is useful for a variety of materials such as disposable diapers.

## 3,586,646
## CATION EXCHANGER WITH SPONGE STRUCTURE

Herbert Corte and Erhard Meier, Leverkusen, and Hans Seifert, Bergedorf Neukirchen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 8, 1958, Ser. No. 727,045
Claims priority, application Germany, Apr. 20, 1957, F 22,878
Int. Cl. C08j *1/34*
U.S. Cl. 260—2.2R 15 Claims

11. A cation exchange resin consisting of a water-insoluble matrix and cation exchange groups bonded thereto which are selected from the group consisting of sulfonic acid, carboxylic acid, phosphoric acid, and phosphonic acid groups, wherein as said matrix there is employed a solid opaque copolymer of spongy structure which is permeated by small veins into which liquids are able to penetrate, which matrix is prepared by copolymerizing a mixture consisting essentially of (1) a monoethylenically unsaturated monomer selected from the group consisting of a monovinyl carbocyclic aromatic compound, a monoethylenically unsaturated carboxylic acid, a monoester of a lower aliphatic alcohol and a monoethylenically unsaturated polycarboxylic acid, a completely esterified monoethylenically unsaturated polycarboxylic acid, and an anhydride of a monoethylenically unsaturated polycarboxylic acid, with (2) a polyethylenically unsaturated monomer selected from the group consisting of a polyvinyl carbocyclic aromatic compound, an ester of a dihydric alcohol and an $\alpha,\beta$-ethylenically unsaturated carboxylic acid, diallyl maleate, divinyl ether, and divinyl ketone, the aforesaid copolymerization being conducted while the monomers are dissolved in 10 to 300% by weight, based on monomer weight, of an organic liquid which is a solvent for said monomers but is unable to dissolve linear carbocyclic aromatic vinyl polymers.

3,586,647

## SOLID STATE POLYCONDENSATION WITH POROUS POLYESTER PREPOLYMER PARTICLES

Ross A. Kremer, Belle Mead, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed July 10, 1968, Ser. No. 743,631
Int. Cl. C08g *53/10, 17/04*
U.S. Cl. 260—2.5 8 Claims

Porous pellets of a polyester prepolymer, such as poly-(ethylene terephthalate), are prepared by dispersing an inert gas or foaming agent in a molten prepolymer and extruding and pelletizing the thus saturated prepolymer to conventional pellet size, (1/16" to 1/2") or to other particulate shapes. These porous particles can be further polycondensed in solid state, under conventional polycondensation conditions, without the necessity of reducing particle size below 20 mesh.

3,586,648

## FLEXIBLE AND HYDROPHILIC POLYURETHANE FOAM AND A METHOD OF MAKING SAME

Joerg Sambeth and Alexis Archipoff, Carouge, Geneva, Switzerland, assignors to Elekal, Paris, France

No Drawing. Filed Nov. 12, 1968, Ser. No. 775,179
Claims priority, application Switzerland, Nov. 13, 1967, 15,922/67
Int. Cl. C08g *22/46, 53/08, 53/20*
U.S. Cl. 260—2.5 10 Claims

To the usual compounds involved in making a flexible open-cell polyurethane foam by the so-called "one-shot" method there are added, from 5 to 30% by weight, in relation to the amount of polyol that is used, at least one water insoluble carboxymethyl cellulose or a water soluble carboxymethyl cellulose salt able to produce, by cation exchange during or after formation of the foam, an insoluble salt, to thereby produce a polyurethane foam having improved hydrophilic properties.

3,586,649

## POLYURETHANE FOAM STRUCTURES WITH INTEGRAL SKIN OF IMPROVED PROPERTIES AND METHOD OF MAKING

David S. Cobbledick, Kent, Ohio, assignor to The General Tire & Rubber Company

No Drawing. Filed Dec. 12, 1968, Ser. No. 783,402
Int. Cl. C08g *22/46, 53/08*
U.S. Cl. 260—2.5AZ 8 Claims

Non-rigid polyurethane foam structures having an integral skin to which surface coatings may be applied that will not discolor on exposure to ultraviolet light are made from polyurethane foam systems that contain a substituted aryl diamine, e.g., methylene-bis-orthochloroaniline, in combination with a polyol prepared by polymerizing an ethylenically unsaturated monomer in situ in an organic polyol of at least 400 molecular weight, e.g., acrylonitrile polymerized in situ in a polyoxyalkylene ether triol.

3,586,650

## POLYURETHANE RESINS PREPARED FROM ALKOXYLATED GLUCOSE DERIVATIVES

John P. Gibbons, Western Springs, and Lawrence Wondolowski, Lemont, Ill., assignors to CPC International Inc.

No Drawing. Filed Nov. 15, 1967, Ser. No. 683,162
Int. Cl. C08g *22/14, 22/44, 23/10*
U.S. Cl. 260—2.5 17 Claims

Covers polyurethane resins. Particularly covers polyurethane resins formed by reacting an organic polyisocyanate and an alkoxylated monoacetone glucose or ethylene glucose having a molecular weight ranging from about 350 to about 5000 and a hydroxyl number ranging from about 40 to about 500. The resins may be in the form of coatings or foams, either of the flexible or rigid type. Also covers a method of preparing the above polyurethanes.

3,586,651

## PROCESS FOR CLOSED-CELL RIGID POLYURETHANE FOAMS

Ival O. Salyer, Dayton, and Robert T. Jefferson, West Carrollton, Ohio, assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Mar. 28, 1968, Ser. No. 716,988
Int. Cl. C08g *22/46*
U.S. Cl. 260—2.5 4 Claims

Closed-cell rigid polyurethane foams are prepared from polyether polyols and polisocyanates using, as a pneumatogen, a cyclopentane-acetone mixture.

3,586,652

## TACK AND GREEN STRENGTH IMPROVED IN EPDM/NATURAL RUBBER BLENDS BY ADDITION OF SILYLAMINE

Parviz Hamed, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Nov. 3, 1969, Ser. No. 873,482
Int. Cl. C08c *9/08*
U.S. Cl. 260—5 3 Claims

Ethylene-propylene-nonconjugated diene terpolymers are elastomeric materials with outstanding resistance to ozone. This is a plus property favoring their use in pneumatic tires, but balancing properties of low building tack and green strength weigh against such use. Blends of EPDM and natural rubber (NR) have a degree of tack and green strength and these properties are further enhanced by the addition of an aminoalkyl trialkoxy silane.

3,586,653

## PROCESS OF MANUFACTURING ALKYD RESINS FROM UNSATURATED FATTY ACIDS, PHTHALIC ANHYDRIDES AND GLYCIDOL

Jacques Fritz, Champagne-au-Mont-d'Or, France, assignor to Progil, Paris, France

No Drawing. Filed Jan. 7, 1969, Ser. No. 789,598
Claims priority, application France, Jan. 12, 1968, 49,516
Int. Cl. C08g *17/007, 17/16;* C09d *3/64*
U.S. Cl. 260—22EP 7 Claims

Modified alkyd resins are made by contacting a mixture of unsaturated fatty acids, phthalic anhydride and glycidol, heating progressively to a temperature of 200–250° C. until the theoretical quantity of water is formed and then removing the unreacted raw materials by distillation. The reaction can be conducted in the presence of an organic solvent.

3,586,654

## PROCESS FOR THE PREPARATION OF POLYMER POWDERS OF CONTROLLED PARTICLE SHAPE, SIZE AND SIZE DISTRIBUTION AND PRODUCT

Frank Lerman and Raymond C. Bartsch, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 557,641, June 15, 1966, and Ser. No. 615,066, Feb. 10, 1967. This application Apr. 15, 1969, Ser. No. 816,421
Int. Cl. C08f *45/06, 47/02*
U.S. Cl. 260—41 29 Claims

Polymer powders are prepared by controlled melting, heating and agitation of a liquid dispersion of polymer particles in the presence of a surfactant. Powders can thus be obtained composed of spherical particles of controlled average size and size distribution, the same, larger or smaller than the starting particles. Particles can also be produced from molten polymer masses in a liquid with added surfactant and then modified in shape, size and size distribution by additional controlled heating and agitation of the liquid dispersion.

3,586,655
**USE OF N-(p-SUBSTITUTED AMINOPHENYL) PIPERIDINES IN RUBBERS**
Kelly Farhat, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
No Drawing. Original application July 12, 1965, Ser. No. 471,409, now Patent No. 3,480,617, dated Nov. 25, 1969. Divided and this application Feb. 17, 1969, Ser. No. 856,506
Int. Cl. C08c *11/46*
U.S. Cl. 260—45.8N 7 Claims
N-(p-substituted aminophenyl) piperidines are antiozonants when used in rubbers.

3,586,656
**STABILIZATION OF ORGANIC MATERIALS WITH PHENOLIC POLYPHOSPHITES**
Patrick A. De Paolo, Jr., Prospect, and Richard A. Doran, Middlebury, Conn., assignors to Uniroyal, Inc.
No Drawing. Original application Feb. 6, 1967, Ser. No. 614,028, now Patent No. 3,509,241, dated Apr. 28, 1970. Divided and this application Oct. 16, 1969, Ser. No. 867,072
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.8 13 Claims
New phenolic polyphosphite-containing compositions, which are reaction products of $PCl_3$ with a substituted hydroquinone (e.g., 2,5-di(t-butyl) hydroquinone), in molar ratio of from 1.2:3.0 to 1.9:3.0. The reaction products are believed to comprise in large part phenolic polyphosphites of the formula $P_x(ORO)_y(OROH)_z$, where $x$ is at least 2 and R is a substituted p-phenylene radical. The phenolic polyphosphite reaction products are useful as stabilizers, particularly in polypropylene, especially in synergistic combination with one or more secondary stabilizers such as thiodipropionates, benzophenones, or benzotriazoles, for optimum protection against both heat aging and ultraviolet radiation.

3,586,657
**STABILIZED CRYSTALLINE PROPYLENE POLYMERS**
John A. Casey, Pepper Pike, Ohio, assignor to Standard Oil Company, Chicago, Ill.
No Drawing. Continuation of application Ser. No. 802,304, Jan. 23, 1969, which is a continuation of application Ser. No. 403,354, Oct. 12, 1964, which is a continuation-in-part of application Ser. No. 46,094, July 29, 1960, which in turn is a continuation-in-part of application Ser. No. 791,251, Feb. 5, 1959, now Patent No. 3,496,128. This application Oct. 30, 1969, Ser. No. 871,775
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.95 6 Claims
Tris phenols are superior stabilizers against melt flow index increases for crystalline polypropylene when being processed and subjected to elevated temperatures and mechanical shear.

3,586,658
**EPOXY RESINS CURED WITH ANHYDRIDE RESIDUE**
George S. Wooster, Hamburg, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed Feb. 10, 1969, Ser. No. 798,170
Int. Cl. C08g *30/12*
U.S. Cl. 260—47EA 10 Claims
Oxirane-containing epoxy resins may be cured by reacting the epoxy resins, optionally in the presence of heat and/or a small amount of a tertiary amine catalyst, with the viscous anhydride residue obtained by the reaction of tetrapropylene with maleic anhydride after substantially complete removal of unreacted substrate and dodecenylsuccinic anhydride from the reaction mixture.

3,586,659
**MOLDING COMPOSITIONS CONTAINING INORGANIC CROSSLINKS**
Russell G. Hay, Gibsonia, and William J. Heilman, Allison Park, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Filed May 28, 1968, Ser. No. 732,531
Int. Cl. C08f *15/00*
U.S. Cl. 260—78.5T 10 Claims
Molding compositions are provided which are curable to objects which contain inorganic crosslinks which do not crack on standing. The composition contains a mixture of a solid comminuted copolymer of an alpha olefin having from 3 to 20 carbon atoms per molecule and maleic anhydride, and a solid comminuted Group II–A metal oxide or hydroxide such as CaO or $Ca(OH)_2$.

3,586,660
**UNITARY LIQUID POLYSULFIDE POLYMER COMPOSITIONS**
Tenji Sakata, Suita-shi, Osamu Nakanishi, Ibaraki-shi, and Ikuo Tanaka, Osaka, Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan
No Drawing. Filed Sept. 30, 1968, Ser. No. 763,983
Claims priority, application Japan, Oct. 3, 1967, 42/63,923
Int. Cl. C08g *23/00*
U.S. Cl. 260—79 6 Claims
A stable, curable, substantially anhydrous, unitary liquid polysulfide composition comprising a liquid organic polysulfide polymer having terminal mercapto groups in its molecule, a peroxide curing agent, and an accelerating agent, characterized by said curing agent being selected from zinc peroxide and cadmium peroxide, and said accelerating agent being normally solid and capable of generating a water-soluble acid when reacted with moisture. Preferred accelerating agent is a salt of an aliphatic carboxylic acid having 1 to 5 carbon atoms with an element selected from the group consisting of aluminium, arsenic, copper, chromium, germanium, iodine, lead, manganese, silicon, tin, titanium and zinc.

3,586,661
**1,2-BUTADIENE COPOLYMERS**
Chester L. Parris, Morris Plains, and Leo S. Rieve, Schooley's Mountain, N.J., assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed Aug. 4, 1969, Ser. No. 847,415
Int. Cl. C08d *3/02, 1/14*
U.S. Cl. 260—85.3 7 Claims
Butadiene copolymers of melting point 30°–120° C. with the major proportion of the butadiene content being combined in the copolymer in the 1,2 form. The comonomer is a non-crystalline hydrocarbon having at least five carbon atoms in the molecule and having a vinyl double bond conjugated with an olefinic double bond. The process of making employs as catalyst a complex of a cobalt compound with butadiene or open chain butadiene dimer and with an organo metallic compound of zinc, lithium or aluminum; and a catalyst modifier of fumaric acid ester or maleic acid ester. The copolymers are formulated to molding compounds which can be cured rapidly and used in transfer molding.

3,586,662
**PREPARING LIGHT-COLORED PROTEIN ISOLATE FROM SUNFLOWER MEAL BY ACID WASHING PRIOR TO ALKALINE EXTRACTION**
David E. O'Connor, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Sept. 8, 1969, Ser. No. 856,164
Int. Cl. A23j *1/14*; C07g *7/00*
U.S. Cl. 260—123.5 9 Claims
Light-colored protein is recovered from sunflower meal by acid washing previous to alkali extraction and acid

precipitation. The isolated protein is suitable for use as a protein supplement additive for food products without imparting to the food products an unappetizing color.

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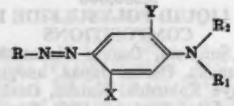
3,586,663

## ETHOXY ETHYL AMINO PHENYL AZO DYESTUFF

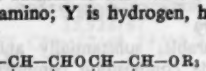
Winfried Kruckenberg, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 12, 1967, Ser. No. 630,214
Claims priority, application Germany, Apr. 19, 1966, F 48,968; Oct. 7, 1966, F 50,378
Int. Cl. C07c *107/04, 107/06;* C09b *29/04*
U.S. Cl. 260—207.1 8 Claims

Water insoluble azo dyestuffs free from sulphonic acid and carboxylic acid groups of the formula



in which R is a radical of the benzene or heterocyclic series; X is acylamino; Y is hydrogen, halogen, alkyl or alkoxy; $R_1$ is



$R_4$, $R_5$, $R_6$ and $R_7$ are hydrogens or lower alkyl radicals with 1 to 2 carbons; $R_2$ is hydrogen or —$COR_8$; $R_3$ is an optionally substituted lower alkyl radical; $R_8$ is $C_nH_{2n+1}$; and $n$ is an integer from 1 to 4. The dyestuffs are useful for dyeing hydrophobic fibers, e.g. aromatic polyesters.

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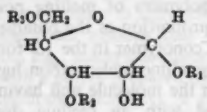
3,586,664

## XYLOSE DERIVATIVES AND PREPARATION THEREOF

Shigeharu Kohno and Isao Yamatsu, Tokyo, Japan, assignors to Eisai Kabushiki Kaisha, Bunkyo-ku, Tokyo, Japan

No Drawing. Filed Mar. 19, 1969, Ser. No. 808,648
Int. Cl. C07c *47/18*
U.S. Cl. 260—210R 5 Claims

New and novel xylose derivatives and preparation thereof, represented by the general formula



wherein $R_1$ is an alkyl or aralkyl radical having more than two carbon atoms and each of $R_2$ and $R_3$ is an alkyl, aralkyl or aracyl radical. The new xylose derivatives are effective for medical treatment of inflammation and edema caused by acetylcholine, histamine and bradykinin.

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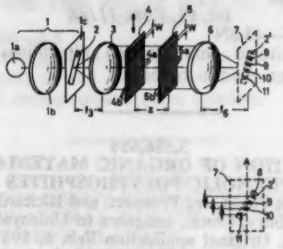
3,586,665

## APPARATUS FOR PRODUCING PHASE-SHIFTED ELECTRIC SIGNALS

Adolf Weyrauch, Aalen, Germany, assignor to Carl Zeiss Stiftung, Wurttemberg, Germany

Filed Apr. 23, 1970, Ser. No. 31,329
Claims priority, application Germany, Apr. 26, 1969, P 19 21 507.7
Int. Cl. G01d *5/34*
U.S. Cl. 250—231 7 Claims

In apparatus for producing phase-shifted electric signals representing the positions of a moving element, light from a source passes through similar first and second gratings, at least one of which moves back and forth in line with the direction of the widths of the grating slits in correspondence with movements of the moving element, and through a lens that focusses the resulting diffraction image

on a row of photoelectric receivers in the focal plane of the lens. The second grating is spaced from the first grating (i.e., the grating itself or its projected image). The distance $a$ between projections of the centers of the receivers on a reference line which is at right angles to the direction of the lengths of the grating slits is

$$a=\frac{wf\phi}{2\pi Z}$$

where $w$ is period length of the grating slits, Z is the length of the optical path from the first grating (the grating itself or its projected image) to the second grating, $f$ is the focal length of the lens, and $\phi$ is the desired phase shift of signals produced by the photoelectric receivers, as measured in radians.

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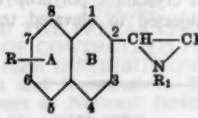
3,586,666

## 2-(2-NAPHTHYL)AZIRIDINE

Keizo Kitahonoki, Ikoma-gun, and Katsumi Kotera, Mishima-gun, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

No Drawing. Continuation-in-part of abandoned application Ser. No. 510,046, Nov. 26, 1965. This application Sept. 3, 1969, Ser. No. 855,020
Claims priority, application Japan, Nov. 26, 1964, 39/66,755; Aug. 13, 1965, 40/49,466
Int. Cl. C07d *23/02*
U.S. Cl. 260—239 1 Claim

A compound of the formula:



wherein R represents hydrogen, halogen, lower alkyl or lower alkoxy, $R_1$ represents hydrogen or acyl, R is possibly present on Ring A and Rings A and B may be aromatic or alicyclic, being useful as a tranquilizer or antidepressant, is prepared by reducing the corresponding oxime compound with a metallic hydride complex in an inert solvent.

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## ERRATUM

For Class 10—135 see:
Patent No. 3,586,455

3,586,667

## PENICILLIN ESTERIFICATION PROCESS

Lowell D. Hatfield, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed Dec. 22, 1967, Ser. No. 692,678
Int. Cl. C07d *99/16, 99/24*
U.S. Cl. 260—239.1 16 Claims

One step esterification of penicillins or penicillin sulfoxides by commingling phosgene with a liquid mixture of the penicillin or penicillin sulfoxide acid or salt, the selected alcohol, a base, preferably a tertiary amine, and an inert organic diluent to form the penicillin or penicillin sulfoxide ester which esters are useful as intermediates in the heat rearrangement to desacetoxycephalosporanate esters, which desacetoxycephalosporin esters can be deesterified or converted to new and known desacetoxycephalosporin antibiotics, e.g., cephalexin.

3,586,668

## PROCESS FOR THE PRODUCTION OF LACTAMS

Otto Immel, Krefeld-Urdingen, and Hans-Helmut Schwarz and Hermann Schnell, Krefeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 23, 1968, Ser. No. 707,423
Claims priority, application Germany, Mar. 3, 1967, F 51,705
Int. Cl. C07d *41/06*
U.S. Cl. 260—239.3 9 Claims

The invention relates to a process for the production of lactams by catalytic rearrangement of ketoximes in the gaseous phase, using as a catalyst system a mixture of boron trioxide or boric acid and highly dispersed carbon, said highly dispersed carbon having a particle size of less than 0.1 mm. in diameter.

3,586,669

## ORALLY ACTIVE ANTI-ESTROGENIC COMPOUNDS

Gary H. Rasmusson, Watchung, and Glen E. Arth, Cranford, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Apr. 22, 1969, Ser. No. 818,447
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 9 Claims

Novel 3-ethers of 19-nor-20-spirox-4-ene prepared from the corresponding 3-beta allylic alcohol having utility as orally active anti-estrogens with low progestational activity.

3,586,670

## ISOTHIOCYANOBENZAZOLES AND USE THEREOF AS ANTHELMINTICS

Paul Brenneisen and Alfred Margot, Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed July 24, 1968, Ser. No. 747,122
Claims priority, application Switzerland, July 26, 1967, 10,628/67
Int. Cl. C07d *49/38, 85/48*
U.S. Cl. 260—240 16 Claims

Isothiocyano-substituted 2-phenyl- and 2-phenylalkylbenzoxazoles and -benzimidazoles are disclosed as novel anthelmintic agents. Their production, their use in the control of helminths and compositions containing them are also described. 2-(4'-isothiocyanophenyl)-benzimidazole and -benzoxazole are representative compounds of this novel class of anthelmintics.

3,586,671

## NOVEL CYANINE DYES AND PHOTOGRAPHIC EMULSIONS CONTAINING SUCH DYES

Frank G. Webster and Donald W. Heseltine, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original application May 17, 1967, Ser. No. 639,024, now Patent No. 3,528,811. Divided and this application Sept. 15, 1969, Ser. No. 871,081
Int. Cl. C09b *23/10*
U.S. Cl. 260—240.4 6 Claims

Cyanine dyes which contain a complex fused pyrimidinedione nucleus linked by a double bond or a dimethine linkage to a desensitizing nucleus are sensitizers for light sensitive silver halide emulsions.

3,586,672

## DIMETHINE DYES CONTAINING A 2-AROMATICALLY SUBSTITUTED INDOLE NUCLEUS AND A SECOND DESENSITIZING NUCLEUS

Robert A. Litzerman, Donald W. Heseltine, and John D. Mee, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Application Jan. 17, 1967, Ser. No. 609,764, which is a continuation-in-part of application Ser. No. 533,459, Mar. 11, 1966. Divided and this application June 19, 1969, Ser. No. 841,187
Int. Cl. C07d *57/00*
U.S. Cl. 260—240 9 Claims

Novel dimethine dyes are provided which contain a 2-aromatically substituted indole nucleus and a second nucleus selected from the group consisting of imidazo [4,5-b]quinoxaline, pyrrolo[2,3-b]pyridyl, nitro-substituted oxazole, nitro-substituted thiazole and nitro-substituted selenazole.

3,586,673

## PREPARATION OF SYMMETRICALLY AND UNSYMMETRICALLY SUBSTITUTED STILBENE-BISBENZOXAZOLES

Melvin S. Bloom, Rochester, N.Y., and James A. Hill, Dover, Del., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Feb. 5, 1968, Ser. No. 702,830
Int. Cl. C09b *23/00*
U.S. Cl. 260—240 5 Claims

Process for the preparation of both symmetrical and unsymmetrical 4,4'-substituted stilbene derivatives, having 2-benzoxazolyl, 2-benzimidazolyl, or 2-benzothiazolyl substituents. The process comprises first reacting a dialkyl 4-substituted benzylphosphonate with a 4-substituted benzaldehyde to form the corresponding 4-heterocyclic-4'-carbonylstilbene compound, which is then treated with an acyl halogenating agent to form the 4-heterocyclic-4'-stilbenecarbonyl halide. The halide is then reacted with an o-amino-phenylene compound to form the subject stilbene derivatives. These stilbene derivatives are useful as optical brighteners.

3,586,674

## ORGANOMETALLIC DERIVATIVES OF 6-LOWER ALKOXY 1-PHENAZINOL 5,10-DIOXIDE

Willy Leimgruber, Montclair, N.J., Gian Paolo Maestrone, Staten Island, N.Y., and Milan Mitrovic, Nutley, and Manfred Weigele, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Continuation-in-part of abandoned application Ser. No. 739,191, June 24, 1968. This application Apr. 8, 1969, Ser. No. 814,429
Int. Cl. C07d *51/80*
U.S. Cl. 260—242 5 Claims

Copper derivatives of 6-lower alkoxy-1-phenazinol 5,10-dioxide prepared by treating a 6-lower alkoxy-1-phenazinol 5,10-dioxide with a copper salt possess broad spectrum anti-microbial activity.

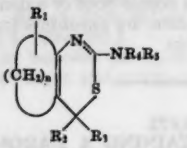
3,586,675

## FUSED THIAZINES

Alexander Crawford Ritchie and Rodney Eric Haddock, London, England, assignors to Allen & Hanburys Limited

No Drawing. Filed Dec. 15, 1967, Ser. No. 690,741
Claims priority, application Great Britain, Dec. 23, 1966, 57,650/66
Int. Cl. C07d 93/08
U.S. Cl. 260—243 8 Claims

Novel thiazine compounds of the following formulae are disclosed



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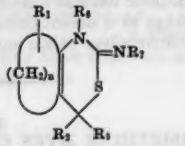

II

These compounds have analgetic and anti-inflammatory activity. Pharmaceutical compositions containing these thiazine compounds are also disclosed as well as processes for the production of such compounds.

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3,586,676

## 1,2-OXAZINYL PHENYL ALKANOIC ACIDS

Rolf Denss, Basel, Switzerland, Niels Clauson-Kaas, Farum, Denmark, and Franz Ostermayer, Riehen, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Apr. 22, 1969, Ser. No. 818,407
Claims priority, application Switzerland, Apr. 29, 1968, 6,375/68
Int. Cl. C07d 87/12
U.S. Cl. 260—244R 4 Claims

The compounds are of the class of [p-(3,6-dihydro-2H-1,2-oxazin-2-yl)-phenyl]-alkanoic acids, the methyl and ethyl esters thereof, as well as the pharmaceutically acceptable salts thereof and have analgesic and anti-inflammatory activity; the compounds are active ingredients of pharmaceutical compositions and are useful for alleviating pain and treating inflammatory diseases in mammals; an illustrative embodiment is [p-(3,6-dihydro-2H-1,2-oxazin-2-yl)-phenyl]-acetic acid.

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3,586,677

## DYESTUFFS FROM NAPHTHOYLENE-BENZIMIDAZOLIUMS

Robert Frederic Michel Sureau, Enghien-les Bains, and Marie-Josephe Jeanne Alicot, Soisy-sous-Montmorency, France, assignors to Ugine Kuhlmann, Paris, France

No Drawing. Filed Jan. 17, 1967, Ser. No. 609,757
Claims priority, application France, Jan. 24, 1966, 46,932
Int. Cl. C07d 87/42
U.S. Cl. 260—247.2 3 Claims

The present invention relates to cationic dyestuffs derived from naphthoylene-benzimidazolium compounds, to the preparation of the dyestuffs, to their use in the coloration of polymers or copolymers of acrylonitrile which they dye in fast shades, and to the colored polymers or copolymers.

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3,586,678

## ISONIPECOTIC ACID DERIVATIVES

Hans Herbert Kühnis and Rolf Denss, Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Dec. 30, 1968, Ser. No. 788,068
Claims priority, application Switzerland, Jan. 11, 1968, 421/68
Int. Cl. C07d 29/30
U.S. Cl. 260—247.5 6 Claims

1-phenylalkyl-isonipecotic acid amides substituted in 4-position by allyl or propinyl as well as the pharmaceutically acceptable acid addition salts thereof are antitussive agents. Pharmaceutical compositions containing these compounds and method for producing an antitussive effect in mammals comprising administering such compounds are provided. An illustrative embodiment is 1-(3-phenylpropyl)-4-allyl-isonipecotic acid morpholide.

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3,586,679

## PROCESS FOR THE PRODUCTION OF 2,4-DICHLORO-6-AMINO-s-TRIAZINES

Jai P. Tandon and William S. Durrell, Mobile, Ala., assignors to Ciba-Geigy Corporation, Greenburgh, N.Y.

No Drawing. Filed Nov. 21, 1968, Ser. No. 777,871
Int. Cl. C07d 55/18
U.S. Cl. 260—249.5 9 Claims

Method for the production of 2,4-dichloro-6-monosubstituted amino-s-triazines by reacting, in an anhydrous system, cyanuric chloride with a mono-substituted amine or a mono-substituted amine hydrohalide. The products obtained by the present invention are intermediates useful in the preparation of diamino-chloro-s-triazine products which are employed in inhibiting the growth of plants and are therefore widely employed as herbicides.

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3,586,680

## 5-IMINO-1,2,4-TRIAZINES

Werner Meiser, Wuppertal-Elberfeld, Ludwig Eue, Cologne-Stammheim, Helmuth Hack, Cologne-Buchheim, Helmut Timmler, Wuppertal-Vohwinkel, and Richard Wegler, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed June 25, 1969, Ser. No. 836,609
Claims priority, application Germany, June 29, 1968, P 17 70 750.5
Int. Cl. C07d 55/08
U.S. Cl. 260—249.5 10 Claims

5-imino-1,2,4-triazines, i.e. 3-(alkylmercapto, alkylamino and dialkylamino)-4-(alkyl and amino)-5-imino-6-(optionally chloro substituted)-phenyl-1,2,4-triazines, which possess herbicidal properties, and which may be produced by conventional methods.

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3,586,681

## 1,4,5,6-TETRAHYDROPYRIDAZINES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of application Ser. No. 566,719, July 21, 1966. This application Nov. 2, 1967, Ser. No. 680,002
Int. Cl. C07d 51/76
U.S. Cl. 260—250 11 Claims

The compounds are of the class of 1,3-substituted-1,4,5,6-tetrahydropyridazines and are prepared by reducing corresponding 2,6-substituted-4,5-dihydro-3-(2H)-pyridazinone intermediates. The compounds, as well as certain intermediates, are useful as anti-inflammatory agents.

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3,586,682

## PREPARATION OF PHTHALAZONE

Allen W. Sogn, Williamsville, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Dec. 19, 1968, Ser. No. 785,396
Int. Cl. C07d 51/02
U.S. Cl. 260—250 10 Claims

The yield and quality of phthalazone prepared by reaction of 3-hydroxyphthalimidine and hydrazine is improved by conducting the reaction in the presence of an acid having a pK value in the range of about 3.5–5.0 and/or a salt thereof. Purification of the product, useful as an intermediate in the preparation of pharmaceuticals, by recrystallization from dilute aqueous acid affords a pure white product.

3,586,683

## 2,5(5) - DI(TRI)SUBSTITUTED - 10b-HYDROXY-3,6 - DIOXO-OCTAHYDRO-OXAZOLO[3,2-a] PYRROLO[2,1-c]PYRAZINE DERIVATIVES OF LYSERGIC ACID

Paul Stadler, Biel-Benken Basel, and Albert Hofmann and Franz Troxler, Bottmingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

No Drawing. Filed Apr. 8, 1968, Ser. No. 719,674
Claims priority, application Switzerland, Apr. 12, 1967, 5,236/67; Nov. 23, 1967, 16,484/67
Int. Cl. C07d *43/20*
U.S. Cl. 260—268 16 Claims

Compounds are of the class of 2,5(5) - di(tri)substituted - 10b - hydroxy - 3,6 - dioxo-octahydro-oxazolo [3,2-a]pyrrolo[2,1-c]pyrazine derivatives of lysergic acid and are useful as vasotonic agents. The compounds are prepared by reacting an appropriate aminocyclol with lysergic acid.

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3,586,684

## DIQUINOLONOPYRIDONE

Chung C. Chen, Belleville, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 11, 1967, Ser. No. 674,635
Int. Cl. C07d *33/50*
U.S. Cl. 260—288 6 Claims

A class of compounds of which diquinolonopyridone is illustrative, and new and useful pigments formed therefrom along with a class of intermediates of which dimethyl-3,5-dianilinochelidamate is typical.

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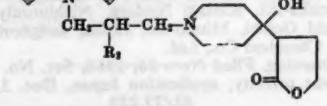
3,586,685

## 4-(2-OXO-3-TETRAHYDROFURYL)-4-PIPERIDINOLS

Ernst Jucker, Ettingen, Anton Ebnother, Reinach Basel-Land, and Erwin Rissi, Basel, Switzerland, assignors to Sandoz Ltd., also known as Sandoz AG, Basel, Switzerland

No Drawing. Original application Apr. 17, 1968, Ser. No. 721,949. Divided and this application Dec. 15, 1969, Ser. No. 889,793
Int. Cl. C07d *29/24*
U.S. Cl. 260—294.3 2 Claims

The invention provides 4-(2-oxo-3-tetrahydrofuryl)-4-piperidinol intermediates for phenothiazine derivatives of the formula:



wherein $R_1$ is hydrogen, chlorine, bromine, trifluoromethyl, cyano or lower alkanoyl, and $R_2$ is hydrogen or methyl, and pharmaceutically acceptable acid addition salts thereof.

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3,586,686

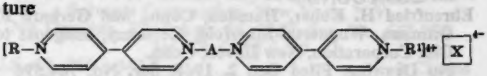
## BIPYRIDYLIUM QUATERNARY COMPOUNDS

John Theodore Braunholtz, Bracknell, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Continuation-in-part of application Ser. No. 803,984, Mar. 3, 1969, which is a continuation-in-part of application Ser. No. 312,001, Sept. 27, 1963. This application June 10, 1970, Ser. No. 45,210
Claims priority, application Great Britain, Oct. 1, 1962, 37,036/62
Int. Cl. C07d *31/48*
U.S. Cl. 260—294.8R 5 Claims

The compounds of the invention consist of certain bis-bipyridylium quaternary salts, to process for making them and to biologically active compositions containing them for herbicidal use.

The bis-bipyridylium salts having the following structure



wherein R and $R^1$ are selected from the group consisting of alkyl radicals having 1–5 carbon atoms, $CH_3COCH_2$— and $HOCH_2CH_2$—; A is selected from the group consisting of alkylene of 1 to 6 carbon atoms, alkylene of 1 to 6 carbon atoms interrupted by an oxygen or sulfur atom, or alkylene of 1 to 6 carbon atoms containing a keto group; and $[X]^{4-}$ represents monomeric anion (anions) in the number required to neutralize the four positive charges of the quaternary cation.

Said compounds are characterized by herbicidal activity through its cation, said cation being deactivated on contact with soil and anions do not interfere with respect to the herbicidal activity of the cation.

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3,586,687

## PROCESS FOR PREPARING 2-[(METHYLSULFINYL) ACETYL]PYRIDINE

George A. Conrad, Jr., Irvington, N.J., assignor to Warner-Lambert Pharmaceutical Company, Morris Plains, N.J.

No Drawing. Filed Feb. 6, 1969, Ser. No. 797,243
Int. Cl. C07d *31/48*
U.S. Cl. 260—294.8 3 Claims

The present invention relates to an improved process for the production of 2-[(methylsulfinyl)acetyl]pyridine. This process utilizes a relatively low temperature reaction in which anhydrous dimethylsulfoxide and ethyl picolinate are first combined and sodium hydride in mineral oil is then added portion-wise while maintaining a temperature of less than 70° C., typically 20° to 30° C.

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3,586,688

## CERTAIN AMINOPYRIDINECARBONYL GUANIDINES

Edward J. Cragoe, Jr., Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Dec. 18, 1968, Ser. No. 784,890
Int. Cl. C07d *31/44*
U.S. Cl. 260—295 9 Claims

(Vic.-aminopyridinecarbonyl)guanidine products which exhibit saluretic and diuretic properties and more importantly are antikaluretic, are described. These compounds are prepared by reaction of a lower alkyl ester of the select vic.-aminopyridine carboxylic acid and a guanidine.

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3,586,689

## ALCOHOL STABLE VINYL ESTER POLYMER LATEXES

Richard G. Nickerson, Harvard, Jack Dickstein and Barry R. Harris, Leominster, Mass., and Samuel Loshaek, Stamford, Conn., assignors to Borden, Inc., New York, N.Y.

No Drawing. Continuation of application Ser. No. 545,548, Apr. 27, 1966. This application Aug. 6, 1969, Ser. No. 849,594
Int. Cl. C08f *15/00, 47/18, 45/34*
U.S. Cl. 260—29.6 15 Claims

This invention relates to a process for preparing a latex adhesive which is stable in the presence of alcoholic thinning materials. More particularly, the invention comprises a process for polymerizing a vinyl ester in the presence of a monoalkyl ester stabilizing agent for alcoholic thinners. Thereafter, alcoholic thinners are added to the latex. The invention also contemplates the latex adhesive made by the above process.

3,586,690

## PROCESS FOR PREPARING 2 - BENZOTHIAZOLONES FROM AROMATIC NITRO COMPOUNDS

Ehrenfried H. Kober, Hamden, Conn., and Gerhard F. Ottmann, Wuppertal-Elberfeld, Germany, assignors to Olin Corporation, New Haven, Conn.

No Drawing. Filed Oct. 2, 1968, Ser. No. 764,596
Int. Cl. C07d 91/44
U.S. Cl. 260—304 13 Claims

The process for preparing 2-benzothiazolones by reacting an aromatic nitro compound, in which at least one of the two ortho positions is unsubstituted, with carbonyl sulfide in the presence of selected catalysts, and recovering the 2-benzothiazolones produced thereby.

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3,586,691

## PROCESS FOR PREPARING 2 - BENZOTHIAZOLONES FROM AROMATIC NITRO COMPOUNDS

Peter H. Scott, Guilford, Conn., assignor to Olin Corporation

No Drawing. Filed Oct. 30, 1968, Ser. No. 772,029
Int. Cl. C07d 91/44
U.S. Cl. 260—304 7 Claims

In the process for preparing 2-benzothiazolones by reacting carbonyl sulfide with an aromatic nitro compound in which at least one of the two ortho positions is unsubstituted, the improvement which comprises carrying out the reaction in the presence of sodium hydrosulfide, and recovering the 2-benzothiazolones produced thereby.

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3,586,692

## 5-FORMAMIDO-4-THIOCARBAMOYL-IMIDAZOLE

Morio Ikehara, Osaka, and Izumi Kumashiro and Akihior Yamazaki, Kanagawa-ken, Japan; said Kumashiro and Yamazaki assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed Oct. 30, 1968, Ser. No. 772,051
Claims priority, application Japan, Nov. 11, 1967, 42/72,246
Int. Cl. C07d 49/36
U.S. Cl. 260—309 1 Claim

5-amino-4-thiocarbamoylimidiazole reacts with formic acid to form 5-formamido - 4 - thiocarbamoylimidiazole which is an effective antimetabolite against NF-sarcoma in mice.

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3,586,693

## IMIDAZO[1,2-a]INDOLIN-9-OLS

Stanley C. Bell, Penn Valley, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 713,327, Mar. 15, 1968, which is a continuation-in-part of application Ser. No. 614,826, Feb. 9, 1967. This application July 7, 1969, Ser. No. 839,636
Int. Cl. C07d 57/02
U.S. Cl. 260—309 10 Claims

This invention relates to new imidazo[1,2-a]indolin-9-ols which have demonstrated pharmacological activity as central nervous system depressants.

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3,586,694

## 1-BENZOYLBENZIMIDAZOL-2-YLACETIC ACIDS

Tsung-Ying Shen, Westfield, and Alexander R. Matzuk, Colonia, N.J., and Harvey Schwam, Flushing, N.Y., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 598,607, Dec. 2, 1966. This appliccation Oct. 18, 1968, Ser. No. 768,884
Int. Cl. C07d 49/38
U.S. Cl. 260—309.2 5 Claims

New 1-benzoylbenzimidazol-2-ylacetic acids are prepared which exhibit anti-inflammatory properties.

3,586,695

## SUBSTITUTED IMIDAZOLINYL INDOLES

Don V. Wysong and Halbert C. White, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Jan. 26, 1968, Ser. No. 700,733
Int. Cl. C07d 49/34
U.S. Cl. 260—309.6 14 Claims

Substituted imidazolinyl indole compounds such as 5-bromo-3-[(2 - imidazolin - 2 - yl)methyl]indole and their pharmaceutically-acceptable salts such as the hydrochloride and hydrobromide salts. The compounds are useful in the study of animal behavior and are particularly useful as antidepressants.

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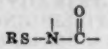
3,586,696

## (ALKYL-, ARALKYL-, AND CYCLOALKYLTHIO) ARYLENEDICARBOXIMIDES

Joseph Edward Kerwood, Akron, Ohio, and Aubert Yaucher Coran, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 714,445, Mar. 20, 1968, which is a continuation-in-part of application Ser. No. 579,493, Sept. 15, 1966; and a continuation-in-part of application Ser. No. 549,730, May 12, 1966, which is a continuation-in-part of application Ser. No. 459,466, May 27, 1965. This application Feb. 25, 1969, Ser. No. 802,265
Int. Cl. C07d 27/52
U.S. Cl. 260—326 11 Claims

Sulfenamides characterized by carbonyl adjacent to the sulfenamide nitrogen, the characteristic nucleus of which is



where the dangling valence on the nitrogen is linked to a second carbonyl, and both carbonyls are linked to arylene, and R is alkyl, aryl substituted alkyl, or cycloalkyl. The compounds inhibit premature vulcanization of vulcanizable elastomers, stabilize styrene-butadiene rubber, and inhibit growth of microorganisms.

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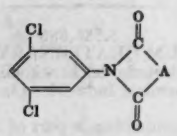
3,586,697

## NOVEL N-(3,5-DICHLOROPHENYL) CYCLIC IMIDE DERIVATIVES

Toshiaki Ozaki, Toyonaka-shi, Akira Fujinami, Ashiya-shi, Fukashi Horiuchi, Takatsuki-shi, Sigeo Yamamoto, Toyonaka-shi, Katsuji Nodera, Nishinomiya-shi, and Tadashi Ooishi, Minoo-shi, Japan, assignors to Sumitomo Chemical Co., Ltd.

No Drawing. Filed Nov. 26, 1968, Ser. No. 779,278
Claims priority, application Japan, Dec. 1, 1967, 42/77,233
Int. Cl. C07d 27/10, 27/18
U.S. Cl. 260—326.5 3 Claims

A cyclic imide of the formula:




wherein A is —CH=CH— or —$CH_2$—$CH_2$—, i.e. N-(3,5 - dichlorophenyl)maleimide or N-(3,5-dichlorophenyl) succinimide, which is prepared by reacting 3,5-dichloroaniline with maleic or succinic anhydride while heating at a temperature from 170 to 200° C., the cyclic imide being useful as an anti-microbial agent.

3,586,698

## MANUFACTURE OF ALKYL-1,3-DIOXANES

Yoshio Ishii, Shizuyoshi Sakai, and Yuji Kawashima, Nagoya-shi, Japan, assignors to New Japan Chemical Co., Ltd., Fushimi-ku, Kyoto-shi, Japan

No Drawing. Filed Mar. 19, 1968, Ser. No. 714,326
Claims priority, application Japan, Mar. 29, 1967, 42/20,162; July 19, 1967, 42/46,773
Int. Cl. C07d *15/04*
U.S. Cl. 260—340.7 6 Claims

A process for manufacturing an alkyl-1,3-dioxane which comprises reacting an olefin having 3 to 8 carbon atoms with formaldehyde in the presence of a catalytic amount of a metal compound which forms a complex compound with the starting olefin under the reaction conditions; the said metal being one member of the group consisting of technetium, rhenium, ruthenium, rhodium, palladium, osmium, iridium and platinum.

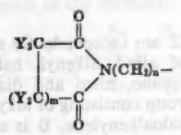
3,586,699

## SUCCINIMIDOALKYLSILANES AND SILOXANES

Tse C. Wu, Waterford, N.Y., assignor to General Electric Company

No Drawing. Original application Dec. 5, 1967, Ser. No. 688,017, now Patent No. 3,444,128, dated May 13, 1969. Divided and this application Oct. 24, 1968, Ser. No. 795,756
Int. Cl. C07d *27/10*
U.S. Cl. 260—326.5 5 Claims

Silanes and siloxanes containing silicon-bonded



radicals, where Y is a member selected from the class consisting of hydrogen, halogen and methyl, *m* is an integer equal to from 1 to 2, inclusive, and *n* is an integer equal to from 2 to 3, inclusive, are prepared by first reacting an N-vinyl-N-allyl succinimide or glutarimide with a silane containing silicon-bonded hydrogens and then converting the silanes to siloxane homopolymers and copolymers. These siloxanes are useful in the preparation of silicone fluids and elastomers having improved resistance to hydrocarbon solvents.

3,586,700

## 3,4,5-TRITHIATRICYCLO[5.2.1.0$^{2,6}$]DECANES AND DERIVATIVES

Abraham Nathan Kurtz and Theodore Curtis Shields, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Feb. 19, 1969, Ser. No. 800,775
Int. Cl. C07d *77/00*; C08g *23/00*
U.S. Cl. 260—327 22 Claims

3,4,5-trithiapolycyclo compounds are produced by reacting a norbornenyl compound with sulfur using ammonia as catalyst. The reaction is carried out by heating a catalyzed mixture of the norbornenyl compound and sulfur at a temperature above about 85° C. 3,4,5-trithiatricyclo [5.2.1.0$^{2,6}$]decane is produced from bicyclo[2.2.1]hept-2-ene and sulfur. The trithiapolycyclo compounds can be polymerized to sulfur containing polymers or they can be converted to their corresponding dithiols; they are also inhibitors of free radical initiated polymerization of ethylenically unsaturated monomers. The polymers can be used to produce films or as protective coatings.

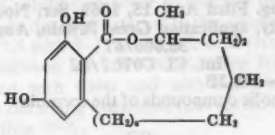
3,586,701

## NORZEARALANE AND ITS PRODUCTION

Wilbert H. Urry, Chicago, Ill., assignor to Commercial Solvents Corporation, New York, N.Y.

No Drawing. Filed Aug. 24, 1967, Ser. No. 662,855
Int. Cl. C07d *9/00*
U.S. Cl. 260—343.2 2 Claims

A new compound and a method for its manufacture is disclosed. The compound d,l-norzearalane is illustrated by the formula:



The compound d,l-norzearalane can be used to aid in increasing the rate of growth in meat-producing animals.

3,586,702

## ZEARALENONE DERIVATIVES

Thomas B. Windholz, Westfield, and Ronald D. Brown, Cranford, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Feb. 27, 1969, Ser. No. 803,047
Int. Cl. C07d *9/00*
U.S. Cl. 260—343.2F 10 Claims

6'-chloroethynyl-carbinol derivatives of the compound, zearalenone, which display estrogenic and anabolic activity are prepared from zearalenone by the chloroethynylation of the 4-monotetrahydropyranyl ether derivative thereof.

3,586,703

## HEAT STABLE MALEIC ANHYDRIDE COMPOSITION

Feliciano Martinez, Elmhurst, N.Y., and Jack B. Feder, Dumont, N.J., assignors to Halcon International, Inc.

No Drawing. Continuation-in-part of application Ser. No. 788,021, Dec. 30, 1968. This application Mar. 18, 1969, Ser. No. 808,327
Int. Cl. C07c *57/14*
U.S. Cl. 260—346.8 7 Claims

This invention relates to a heat stable composition of maleic anhydride, wherein small amounts of materials, such as alkali and alkali sulfates and halides are added to commercial maleic anhydride in order to essentially retain its color both on standing and heating.

3,586,704

## PROCESS FOR THE PREPARATION OF AN ALKYL NITRILE, A FATTY ACID AND A FATTY ACID AMIDE

Alan F. Ellis, Murrysville, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 535,700, Mar. 21, 1966. This application Dec. 9, 1968, Ser. No. 782,450
Int. Cl. C09f *1/00*; C11c *1/00*; C07c *121/16, 121/18; 53/00, 97/16*
U.S. Cl. 260—404 14 Claims

A process is proposed for the preparation of a reaction product containing at least one compound selected from an alkyl nitrile, a fatty acid and a fatty acid amide. The process comprises reacting a 1-nitro-2-nitrosoalkane, such as 1-nitro-2-nitrosohexane, or a 1-nitroalkanone-2 oxime, such as 1-nitrohexanone-2 oxime, with aqueous sulfuric acid in which the concentration of the $H_2SO_4$ is sufficient to form a one phase reaction medium with the 1-nitro containing charge stock and, optionally, in the presence of a lower alkyl fatty acid, such as acetic acid, as a diluent. Phosphoric acid in the same concentration range

can be substituted for the sulfuric acid to produce a reaction product containing at least one compound selected from a fatty acid and a fatty acid amide.

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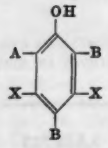
3,586,705
OXIDATION RETARDERS
William J. Owen, Penarth, Glamorgan, and Bryan E. Cooper, Cefn Glas, Bridgend, Glamorgan, Wales, assignors to Midland Silicones Limited, Reading, England
No Drawing. Filed Aug. 15, 1968, Ser. No. 752,790
Claims priority, application Great Britain, Aug. 17, 1967, 38,006/67
Int. Cl. C07f 7/02
U.S. Cl. 260—448.2B 8 Claims

Novel phenolic compounds of the formula



where A is an organosilicon substituent bonded to the ring through a carbon bridge, X is alkyl or alkaryl, and B is A or X, are prepared employing Mg to bond the organosilicon groups to chloroalkyl groups on the ring. The compounds are useful as oxidation retarders.

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3,586,706
ORGANOSILICON COMPOUNDS
Richard P. Bush, Llandough, Penarth, Glamorgan, and Christopher Arthur Pearce, Cowbridge, Glamorgan, Wales, assignors to Midland Silicones Limited, Reading, England
No Drawing. Filed Oct. 2, 1968, Ser. No. 764,588
Claims priority, application Great Britain, Oct. 5, 1967, 45,559/67
Int. Cl. C07f 7/10
U.S. Cl. 260—448.2N 6 Claims

Siloxane-silazane copolymers of the general formula, $[(R_3Si)_3NSiR'_2(OSiR''_2)_nO]_2SiR'''_2$ where the various R's are defined organic radicals and hydrogen atoms and $n$ is 0 or 1 are disclosed. These copolymers are prepared by reacting the corresponding silazane-siloxanol with certain amino-silicon compounds. The novel compounds are useful as anti-foaming agents.

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3,586,707
ESTERIFICATION OF MONO HALO-DINITROETHANOL AND TRINITROETHANOL IN THE PRESENCE OF PYRIDINE-N-OXIDE
Thomas N. Hall, Adelphi, Md., assignor to the United States of America as represented by the Secretary of the Navy
No Drawing. Continuation-in-part of application Ser. No. 407,929, Oct. 30, 1964. This application Nov. 4, 1968, Ser. No. 773,299
Int. Cl. C07c 67/00, 69/78
U.S. Cl. 260—476 8 Claims

A method for the preparation of carboxylic acid esters which consists of reacting negatively substituted carbinols with an acid halide in the presence of pyridine N-oxide.

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3,586,708
ARSANILIC ACID PRODUCTION PROCESS
Joseph W. Nemec, Rydal, and Harry R. Raterink, Drexel Hill, Pa., and Stanley W. Wise, Audubon, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.
No Drawing. Filed May 1, 1969, Ser. No. 821,142
Int. Cl. C07f 9/76, 9/78
U.S. Cl. 260—442 12 Claims

A process is provided for preparing arsanilic acid in yields of about 45% or higher, based on the weight of arsenic acid reactant, by reacting arsenic acid and aniline at a temperature of about 130° to 180° C. in the presence of a chelating agent and a solvent which forms an azeotropic distillate with water formed in the reaction. This reaction produces a mixture of arsanilic acid and di-(p-aminophenyl) arsenic acid, and the latter is converted to arsanilic acid by hydrolysis at an acid pH of about 2 to 3.

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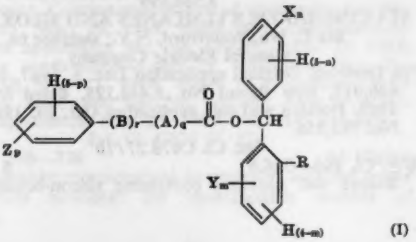
3,586,709
2-DIALKYLAMINOBENZHYDRYL ESTERS OF AROMATIC ACIDS
Sidney B. Richter and David P. Mayer, Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.
No Drawing. Filed Sept. 9, 1968, Ser. No. 758,585
Int. Cl. C07c 93/26, 149/40
U.S. Cl. 260—473 8 Claims

This invention discloses new 2-dialkylaminobenzhydryl esters of aromatic acids having the following general formula:



(I)

wherein X, Y and Z are independently selected from the group consisting of alkyl, alkenyl, halogen, haloalkyl, alkoxy, alkylthio, cyano, nitro and dialkylamino. A is selected from the group consisting of alkylene, alkenylene, haloalkylene and haloalkenylene. B is selected from the group consisting of oxygen, sulfur, —SO— and —$SO_2$—; $m$ is an integer from 0 to 4; $n$ and $p$ are each integers from 0 to 5; $r$ and $q$ are each integers from 0 to 1; and R is dialkylamino. This invention further discloses new acaricidal and insecticidal compositions comprising an inert carrier and a compound of the above description.

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3,586,710
ESTROGENIC B-NOR STEROIDS
Marinus Los, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Nov. 12, 1968, Ser. No. 775,106
Int. Cl. C07c 43/20, 49/76, 69/14
U.S. Cl. 260—488CD 6 Claims

This invention relates to B-nor steroids, a method for the preparation of said compounds from simpler moieties and to the use of said compounds as estrogenic agents in the treatment of warm-blooded animals.

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3,586,711
ESTERS OF ACRYLIC AND METHACRYLIC ACIDS WITH POLYAMINO ALCOHOLS
Mikhail Alexeevich Korshunov, Ulitsa Pervomaiskaya 9, kv. 41; Friziyan Nikolaevich Bodnarjuk, Ulitsa Tolbukhina 40, kv. 40; Vadim Emmanuilovich Lazaryants, Ulitsa Radischeva 13, kv. 9; Anatoly Mikhailovich Kutlin, Ulitsa Grazhdanskaya 41, kv. 6; Klavdia Nikolaevna Malkova, Pr. Lenina 30, kv. 44; and Nikolai Arkadievich Preobrazhensky, Pr. Lenina 36, kv. 41, all of Yaroslavl, U.S.S.R.
No Drawing. Filed May 1, 1967, Ser. No. 634,922
Int. Cl. C07c 69/54
U.S. Cl. 260—486 1 Claim

A series of esters of acrylic and methacrylic acid containing in their alcohol residue two or three tert-alkylamino or tert-amino groups of various structures. There

are disclosed different methods for their production: by the reaction of di- or triaminoalkanols with acrylic or methacrylic acids, their chlorides or lower alkyl esters.

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3,586,712

## ATTRACTANT FOR PINK BOLLWORM MOTHS

Nathan Green, Silver Spring, Md., and John C. Keller, Tempe, Ariz., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Dec. 2, 1968, Ser. No. 780,596
Int. Cl. C07c *69/14*
U.S. Cl. 260—488 1 Claim

A new organic ester, cis-7-hexadecen-1-ol acetate, also known as "hexalure" is synthesized and found to be a powerful attractant under field conditions for adult male pink bollworm moths.

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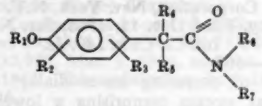
3,586,713

## AMIDES AND N-HYDROXYAMIDES OF SUBSTITUTED ARYLACETIC ACIDS AND CORRESPONDING SALTS

Nguyen Phuc Buu-Hoi, Hue, Vietnam, and Georges Emile Lambelin, Claude Leon Gillet, Jacques Emile Thiriaux, and Georges Joseph Mees, Brussels, Belgium, assignors to Madan AG, Chur, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 598,174, Dec. 1, 1966. This application Nov. 5, 1968, Ser. No. 773,623
Claims priority, application Belgium, Dec. 9, 1965, 673,495; Nov. 7, 1966, 689,347
Int. Cl. C07c *83/00;* A61k *9/02, 25/00*
U.S. Cl. 260—500.5 9 Claims

A new group of amides and N-hydroxyamides of substituted arylacetic acids of the formula:



(I)

wherein:

$R_1$ represents linear or branched alkyl $C_1$–$C_8$, linear or branched alkenyl $C_3$–$C_4$, linear or branched alkynyl $C_3$–$C_4$, cycloalkyl $C_5$–$C_6$ or cycloalkenyl $C_5$–$C_6$;

$R_4$ and $R_5$ being identical or different, represent hydrogen, linear or branched alkyl $C_1$–$C_4$, cycloalkyl $C_5$–$C_6$, hydroxy or dialkylaminoalkyl;

$R_2$ and $R_3$ represent either both halogens, or halogen and hydrogen, or halogen and alkyl or both hydrogen but, in this case, only when one or both $R_4$ and $R_5$ are different from hydrogen;

$R_6$ and $R_7$ are either identical or different members of the group comprising: hydrogen, linear or branched alkyl $C_1$–$C_4$, dialkylaminoalkyle, hydroxyalkyle $C_1$–$C_4$ and phenylalkyle (alkyl $C_1$–$C_4$), or $R_6$ represents hydroxy radical while $R_7$ represents hydrogen, or $R_6$ and $R_7$ form together with the nitrogen atom a heterocyclic ring,

said new compounds, including alkali or alkaline-earth metal salts and ammonium salts of N-hydroxyamides, possess a combination of antipyretic, anti-inflammatory, analgesic and antispasmodic properties.

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3,586,714

## PROCESS FOR PREPARING SORBIC ACID

Mario Dubini and Mario Ferraris, Novara, Sergio Merzoni, Milan, and Gian Paolo Chiusoli, Novara, Italy, assignors to Montecatini Edison S.p.A.

Filed June 10, 1968, Ser. No. 735,9006
Claims priority, application Italy, June 12, 1967, 17,098/67
Int. Cl. C07c *57/10*
U.S. Cl. 260—526 4 Claims

Described is a process for preparing 2-trans-4-trans sorbic acid from pure methyl 2-cis-5, 2-trans-5, 3-trans-5 hexadienoate or from mixtures thereof. The process is characterized by the following steps: Methyl hexadienoate is dissolved in methanol, using 0.5 to 1 part of methanol per 1 part of ester; solid sodium hydroxide is added in amount from 0.5 to 3% by weight in respect of the ester and the whole is agitated at 20–40° C. for 60–120 minutes (step A); sodium hydroxide is added in stoichiometric amount for the saponification and the whole is heated to 60–80° C. for 60–120 minutes under stirring (step B); water is added in amount from 0.5 to 1.5 volumes of water per volume of solution in order to dissolve the salts, and the methanol is distilled (step C); the solution is acidified to pH of 3.5 with 5–15% sulfuric acid (step D); after filtration at between 30 and 40° C. (step E), the filter cake is washed with water and with aqueous methanol (step F) thus obtaining 2-trans-4-trans sorbic acid, with a purity higher than 99%.

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3,586,715

## UNSATURATED CARBOXYLIC SALT MATERIALS AND DERIVATIVES THEREOF

Fred Smeets, Tienen, Belgium, assignor to N.V. La Citrique Belge, Tienen, Belgium

Filed July 8, 1966, Ser. No. 563,816
Claims priority, application Great Britain, July 19, 1965, 30,640/65
Int. Cl. C07c *57/02*
U.S. Cl. 260—535 11 Claims

This invention relates to polycarboxylic acids having more than three carboxylic acid groups and alkali and alkaline earth metal salts thereof prepared by the pyrolysis of alkaline earth metal salts of citric acid. The compounds are intermediates for sulfo-acid materials used in preparing surface active agents, ion exchange materials and detergents.

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3,586,716

## PROCESS FOR CONTINUOUS HYDROLYSIS OF GLYCOL ESTER

Teruo Yasui, Masuhiko Tamura, and Mitsutoshi Tsutsumi, Kurashiki, Japan, assignors to Kurashiki Rayon Co., Ltd., Kurashiki, Japan

Filed Nov. 20, 1968, Ser. No. 777,333
Claims priority, application Japan, Nov. 25, 1967, 42/75,819
Int. Cl. C07c *53/02, 53/08, 53/22*
U.S. Cl. 260—541 8 Claims

Process for the hydrolysis of an ester of lower alkylene glycol and lower aliphatic carboxylic acid in a continuous system which comprises reacting a mixture of ester, water, and acid catalyst continuously fed from the upper part of a column reactor with a countercurrent lower alkyl ether continuously fed from the lower part of the reactor as an extracting agent and continuously removing the ether containing generated lower aliphatic carboxylic acid from the top of the reactor and the water containing generated lower alkylene glycol from the bottom of the reactor.

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3,586,717

## BIS(FLUOROALIPHATICSULFONAMIDOPHENYL) DERIVATIVES

Joseph K. Harrington, Edina, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 588,338, Oct. 21, 1966. This application Mar. 17, 1969, Ser. No. 807,906
Int. Cl. A01n *9/16;* C07c *143/74*
U.S. Cl. 260—556 13 Claims

Bis(fluoroaliphaticsulfonamidophenyl) derivatives wherein the phenyl rings are joined by a carbon-carbon bond, a methylene or ethylene radical, divalent sulfur or oxygen or a sulfinyl or sulfonyl group are disclosed. The phenyl rings are optionaly substituted. These compounds

and their salts have utility as monomers, intermediates, polymerization catalysts and initiators and polymer cross-linkers and chain extenders. Some of the compounds of this invention are also active herbicides and plant growth modifying agents.

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3,586,718

## DIBENZO[a,d]CYCLOHEPTA[1,4]DIEN-5-ONES

Albrecht Edenhofer, Riehen, and Hans Spiegelberg, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application Jan. 3, 1966, Ser. No. 517,893, now Patent No. 3,478,048, dated Nov. 11, 1969. Divided and this application July 1, 1969, Ser. No. 838,317

Claims priority, application Switzerland, Jan. 8, 1965, 232/65; Jan. 14, 1965, 525/65; Dec. 17, 1965, 525/65

Int. Cl. C07d *51/70*

U.S. Cl. 260—562 4 Claims

2,3;3a,12b-tetrahydro - 8H - dibenzo[3,4;6,7]cyclohept[1,2-d]-oxazoles and dibenzo[a,d]cyclohept[1,4]-dienes bearing, for example, substituents at the 10- and 11-positions, are prepared, inter alia, from the corresponding dibenzocycloheptatrienones. The products are useful as antidepressants.

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3,586,719

## PROCESS FOR PREPARING 4-FLUORO-3-NITROANILINE

Milos S. Bil, Forest Hills, N.Y., assignor to Clairol Incorporated, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 683,758, Nov. 2, 1967. This application May 1, 1968, Ser. No. 725,936

Int. Cl. C07c *85/00*

U.S. Cl. 260—578 11 Claims

Prepares 4-fluoro-3-nitroaniline by nitrating p-fluoroaniline under anhydrous conditions. Also employs diluted hydrochloric acid to separate product from reaction mixture.

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3,586,720

## METHOD FOR THE CATALYTIC DEHYDROGENATION OF CYCLODODECANOL IN THE LIQUID PHASE

Wilhelm Knepper, Manfred zur Hausen, and Gunter Hockele, Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Kreis Recklinghausen, Germany

No Drawing. Filed Jan. 13, 1967, Ser. No. 608,982

Claims priority, application Germany, Feb. 4, 1966, C 38,121

Int. Cl. C07c *45/00, 35/02, 5/02*

U.S. Cl. 260—586 2 Claims

A carrier catalyst composition for use in dehydrogenating cyclododecanol, in the liquid phase, at a temperature of from about 180° C. to 271° C., consists essentially of copper on, as carrier, either active aluminum oxide or highly dispersed silicic acid, which carrier had had, after drying at 120° C., a loss on ignition of from 1 to 10% by weight, the amount of copper contained therein and thereon being from 5 to 10 parts by weight of copper per one part by weight of said loss of ignition, which composition had been calcined at a temperature of 600–1100° C.

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3,586,721

## STABILIZED FORMALDEHYDE

Donald B. Griffin, Tuscaloosa, Ala., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 234,562, Oct. 31, 1962. This application June 27, 1966, Ser. No. 560,852

Int. Cl. C07c *47/04*

U.S. Cl. 260—606 11 Claims

An aqueous solution stabilized against precipitation of formaldehyde polymers, the solution comprising water, formaldehyde dissolved therein and a stabilizing amount of a compound having the general formula:

$$H(CH_2)_m—R—O—(C_2H_4O)_nH$$

wherein R is the aromatic radical $—C_6H_4—$, wherein $m$ is an integer ranging from 4 to 10, and wherein $n$ is an integer ranging from 5 to 15 to stabilize said solution against deposition of solid material from the solution.

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3,586,722

## SULFONYL PEROXIDES

Jose Sanchez, Grand Island, and Richard Anthony Bafford, Tonawanda, N.Y., assignors to Pennwalt Corporation, East Orange, N.J.

No Drawing. Filed Oct. 31, 1968, Ser. No. 772,418

Int. Cl. C07c *161/00;* C08f *1/60*

U.S. Cl. 260—607 7 Claims

Sulfonyl peroxides of the formula:

$$R_1R_2R_3C—SO_2—OO—C(O)R_4$$

where $R_1$, $R_2$, and $R_3$ are alkyl or cycloalkyl or substituted alkyl radicals; $R_4$ is alkyl; and the tert radical can be a tricycloalkyl. For example, acetyl tert-butylsulfonyl peroxide and acetyl 1-adamantylsulfonyl peroxide.

A vinyl polymerization process wherein the above sulfonyl peroxides are used as polymerization initiators.

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3,586,723

## PREPARATION OF DIALKYL DISULFIDES

Forrest C. Alley, Clemson, S.C., assignor to Westvaco Corporation, New York, N.Y.

No Drawing. Filed Dec. 11, 1968, Ser. No. 783,149

Int. Cl. C07c *149/12*

U.S. Cl. 260—608 6 Claims

A method of preparing lower dialkyl disulfides by contacting gas stream comprising a lower alkyl mercaptan and an oxygen-containing gas with an activated carbonaceous catalytic adsorbent, wherein the relative humidity at initial contact is at least 70 percent and the contact temperature is between 27° C. and 82° C. and recovering the thus formed dialkyl disulfide from the carbonaceous adsorbent.

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3,586,724

## ANESTHETIC COMPOSITION

Ross C. Terrell, Plainfield, N.J., assignor to Air Reduction Company, Incorporated, New York, N.Y.

No Drawing. Original application Mar. 14, 1968, Ser. No. 712,903. Divided and this application Nov. 14, 1969, Ser. No. 871,294

Int. Cl. C07c *43/12*

U.S. Cl. 260—614 1 Claim

This invention relates to the novel compound 1,1,2 trifluoro-2-bromoethyl difluorochloromethyl ether having the formula $CF_2ClOCF_2CHFBr$. The compound is prepared through stepwise chlorination and fluorination reactions starting with 1,1,2 trifluoro-2-bromoethyl methyl ether. The compound is useful as an anesthetic and as a solvent and dispersant for fluorinated materials.

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3,586,725

## 2,4-DIHALO-3,5-DINITROBENZOTRIFLUORIDES

Don L. Hunter, Anaheim, Calif., assignor to United States Borax & Chemical Corporation, Los Angeles, Calif.

No Drawing. Filed June 12, 1969, Ser. No. 832,860

Int. Cl. C07c *79/12*

U.S. Cl. 260—646 7 Claims

2,4-dihalo-3,5-dinitrobenzotrifluorides in which the halo is bromo or chloro. The compounds are prepared

by reaction of 2,4-dihalobenzotrifluoride with a mixture of fuming sulfuric acid and fuming nitric acid at a temperature of below about 90° C. They are useful as intermediates for the preparation of herbicides.

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3,586,726

## ETHYLIDENEBICYCLOHEPTENE

Kenneth E. Atkins, South Charleston, W. Va., Henry E. Fritz, Tarrytown, N.Y., and David W. Peck, Charleston, W. Va., assignors to Union Carbide Corporation

No Drawing. Filed Feb. 9, 1967, Ser. No. 614,802
Int. Cl. C07c *5/24, 13/28*
U.S. Cl. 260—666A 10 Claims

Ethylidenebicycloheptene is produced by the catalytic isomerization of vinylbicycloheptene at elevated temperatures. The catalysts are the complex compositions obtained by the reduction of the salts of the transition metals cobalt and iron with hydrocarbylaluminum compounds, and the carbonyl compounds of said transition metals. Ethylidenebicycloheptene is a known compound useful as a comonomer in the production of ethylene-propylene terpolymers.

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3,586,727

## PROCESS FOR THE MANUFACTURE OF SUBSTITUTED 8, 10, AND 12-MEMBER RINGS BY THE CATALYTIC COOLIGOMERIZATION OF UNSATURATED COMPOUNDS

Günther Wilke and Paul Heimbach, Mulheim (Ruhr), Germany, assignors to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany

No Drawing. Continuation-in-part of applications Ser. No. 76,520, Dec. 19, 1960, Ser. No. 203,753, June 20, 1962, Ser. No. 532,900, Mar. 9, 1966, and Ser. No. 582,775, Sept. 27, 1966. This application July 18, 1969, Ser. No. 843,220
Int. Cl. C07c *3/10*
U.S. Cl. 260—666 7 Claims

Process of cyclocooligomerization of two different conjugated dienes to produce alicyclic products having at least 8 carbon atoms in the ring, at least two locations of olefinic unsaturation in the ring, and at least one substituent pendent from the ring, which process cyclocooligomerizes the two different conjugated dienes in contact with a carbonyl-free, zero valent nickel compound catalyst. Many of the new products thus formed by this process are described, characterized, and claimed.

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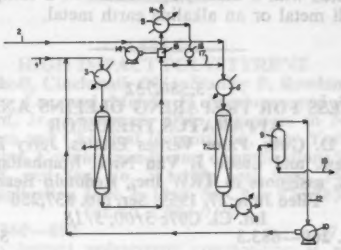
3,586,728

## PROCESS FOR THE PREPARATION OF HIGH PURITY CYCLOHEXANE

Seiya Otani, Tokyo, Takao Iwamura, Otsu-shi, Toru Yamazaki and Yoshio Noguchi, Tokyo, and Takeaki Akatsuka, Otsu-shi, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed June 11, 1969, Ser. No. 832,389
Claims priority, application Japan, June 21, 1968, 43/42,549
Int. Cl. C07c *5/10*
U.S. Cl. 260—667 4 Claims

High purity cyclohexane is produced by hydrogenation of benzene in a plurality of series-connected catalytic reactors wherein benzene, preferably free of impurities, is fed to the first reactor, hydrogenation gas is recycled from the last to the first reactor and, at a point intermediate the first and last reactor, a portion of the partially depleted hydrogenation gas is withdrawn and fresh hydrogenation gas, i.e., a gas having a high hydrogen content, fed to the system. The mole ratio of hydrogen to benzene feed is 3–3.8:1, the volumetric ratio of hydrogenation gas not withdrawn to that which is withdrawn at the depleted hydrogenation gas separator is 6–80:1, and the



temperature in the initial catalyst reaction layer is 165–220° C.

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3,586,729

## PROCESS AND CATALYSTS FOR CONVERTING HYDROCARBONS, PARTICULARLY BY ALKYLATION AND POLYMERIZATION

Bernard Juguin and Jean François Le Page, Rueil-Malmaison, France, assignors to Societe Francaise des Produits Pour Catalyse, Rueil-Malmaison, Hauts-de-Seine, France

No Drawing. Filed May 16, 1969, Ser. No. 825,423
Claims priority, application France, May 16, 1968, 152,129
Int. Cl. C07c *3/54, 3/16*
U.S. Cl. 260—671 12 Claims

For the alkylation of aromatic hydrocarbons, or for producing oligomers from olefins, there is employed an improved catalyst resulting from the impregnation of a silica carrier with phosphoric anhydrides or a precursor thereof, and the subsequent calcination of the impregnated carrier, said carrier consisting of agglomerates of microballs of silica hydrogel, having a size on the order of about 100–800 microns. The microballs have a specific surface of preferably 200–300 $m.^2/g.$ and a pore volume between 1 and 1.5 $cm.^2/g.$ The preferred molar ratio of phosphoric anhydride to silica is 0.7–1.5, and the preferred calcination temperature is 200–700° C.

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3,586,730

## DEHYDROGENATION OF HYDROCARBONS OF 4 TO 5 CARBON ATOMS

Glenn O. Michaels, South Holland, and John Mooi, Homewood, Ill., assignors to Sinclair Research, Inc., New York, N.Y.

No Drawing. Filed Oct. 28, 1966, Ser. No. 590,210
Int. Cl. C07c *5/18*
U.S. Cl. 260—680 9 Claims

Hydrocarbons of 4 to 5 carbon atoms are subjected to vapor phase dehydrogenation in the presence of a dehydrogenation catalyst consisting essentially of a minor amount of a platinum group metal, about 5 to 50 weight percent of $Cr_2O_3$, about 0.1 to 2 weight percent of alkali metal as the alkali metal oxide, and at least about 30 weight percent of activated alumina.

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3,586,731

## OLEFIN CONVERSION AND CATALYSTS THEREFOR

Louis F. Heckelsberg, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Apr. 3, 1967, Ser. No. 627,636
Int. Cl. C07c *5/00*
U.S. Cl. 260—683 16 Claims

Olefins are converted to other olefins having different molecular weights by contact with an olefin reaction catalyst active for disproportionating propylene into ethylene

and butene comprising silica promoted with an oxide, sulfide or hexacarbonyl of tungsten or molybdenum or with an oxide of rhenium, vanadium, niobium or tantalum and treated with a modifying amount of a compound of an alkali metal or an alkaline earth metal.

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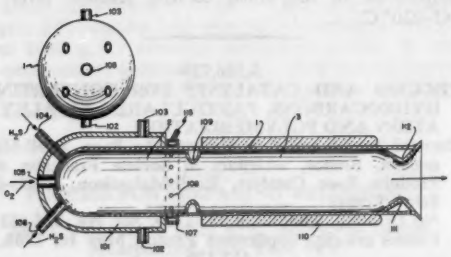
**3,586,732**

## PROCESS FOR PREPARING OLEFINS AND THE APPARATUS THEREFOR

**Eugene D. Guth, Palos Verdes Estates, Jerry L. Lewis, Cypress, and Leslie J. Van Nice, Manhattan Beach, Calif., assignors to TRW Inc., Redondo Beach, Calif.**

**Filed June 27, 1969, Ser. No. 837,250**
**Int. Cl. C07c 3/00, 5/18**
**U.S. Cl. 260—683.3** **35 Claims**



This invention relates to a continuous process for preparing an olefin product comprising prevailing amounts of propylene and the apparatus therefor under substantially adiabatic conditions. Specifically, the process comprises the oxidation of at least one sulfur-containing compound e.g. hydrogen sulfide in the oxidation-reaction zone of a substantially adiabatic reactor, at temperatures ranging up to about 4500° F. and at pressures ranging up to about 1500 p.s.i.a. The oxidation-reaction products passing from the oxidation-reaction zone of said reactor are brought in direct contact and mixed with hydrocarbons containing a substantial amount of propane. The propane is converted to propylene in the dehydrogenation-reaction zone of the same reactor. The dehydrogenation of the propane is carried out in the presence of the oxidation-reaction products at mixing temperatures which may range up to about 4500° F., at pressures ranging up to about 1400 p.s.i.a. and for a contact or reaction timer ranging up to about 60 seconds. The reactor wherein the reactions take place comprises a substantially cylindrical vessel having a plurality of reaction zones. The first of said reaction zones comprises means for receiving combustible materials and is substantially surrounded by a coolant. The second of said reaction zones is insulated and has means for controlling the relative pressures between the first and second zones. The reactor has on its outer periphery means for carrying hydrocarbons into the area of the dehydrogenation zone wherein said hydrocarbons are converted to olefins.

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**3,586,733**

## OXIDATIVE DEHYDROGENATION OF PARAFFINS

**James E. Connor, Jr., Wynnewood, Alfred F. D'Alessandro, Havertown, Harold Shalit, Drexel Hill, and Edward S. J. Tomezsko, Media, Pa., assignors to Atlantic Richfield Company, New York, N.Y.**

**No Drawing. Filed July 24, 1969, Ser. No. 844,608**
**Int. Cl. B01j 11/56; C07c 5/18, 11/06**
**U.S. Cl. 260—683.3** **10 Claims**

Method for the oxidative dehydrogenation of paraffins to produce olefins by contacting the paraffins with molecular oxygen, in the presence of molten alkali metal hydroxides, and aluminum or activated alumina.

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**3,586,734**

## PROCESS FOR PREPARING α-OLEFIN MIXTURE

**Eiichi Ichiki, Hirosuke Ryu, and Yasumiti Namba, Niihama-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Higashi-ku, Osaka, Japan**

**No Drawing. Filed Mar. 18, 1968, Ser. No. 714,001**
**Claims priority, application Japan, Mar. 23, 1967, 42/18,386**
**Int. Cl. C07c 3/10**
**U.S. Cl. 260—683.15D** **5 Claims**

α-Olefin mixture having about 7 to about 18 carbon atoms is selectively prepared in one step by reacting ethylene with propylene at a reaction temperature of 120° to 180° C. under reaction pressure of 40 to 150 kg./cm.² in the presence of an alkylaluminum compound as a catalyst.

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**3,586,735**

## RUBBER MIXTURES REINFORCED BY PHENOL NOVOLAC RESINS AND PROCESS FOR PREPARING PHENOL NOVOLAC RESINS SUITABLE THEREFOR

**Arnold Giller, Wehen, Taunus, Kurt Hultzsch, Wiesbaden, and Wolfgang Hesse, Wiesbaden-Biebrich, Germany, assignors to Chemische Werke Albert, Wiesbaden-Biebrich, Germany**

**Continuation of application Ser. No. 544,404, Apr. 22, 1966. This application Nov. 13, 1969, Ser. No. 871,551**
**Claims priority, application Germany, Apr. 29, 1965, C 35,728; July 24, 1965, C 36,494**
**Int. Cl. C08d 9/10**
**U.S. Cl. 260—845** **8 Claims**

A non-smelling and non-discoloring elastomer composition comprising at least one vulcanizable elastomeric copolymer and at least one phenol novolac-hexamethylenetetramine-resin as a reinforcing resin, said phenol novolac having been prepared by acid condensation of a diphenylolalkane of the formula

with formaldehyde, or a functional equivalent thereof, the radicals $R_1$ and $R_2$ being the same or different and representing hydrogen or an alkyl group of up to 8 carbon atoms or one of the radicals $R_1$ and $R_2$ being a phenyl group and a process for the preparation of said novolac or for the preparation of a vulcanized product from said composition.

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**3,586,736**

## VINYL ETHER MODIFIED POLYPHENYLENE OXIDE

**Toshio Takemura, Kamigyo-ku, Kyoto, Isamu Nakagawa, Sumiyoshi-ku, Osaka, and Seizo Nakashio, Nishinomiya-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Higashi-ku, Osaka, Japan**

**No Drawing. Filed June 5, 1969, Ser. No. 830,853**
**Claims priority, application Japan, June 7, 1968, 43/39,061**
**Int. Cl. C08f 29/30, 43/02**
**U.S. Cl. 260—874** **27 Claims**

A novel modified polyphenylene oxide which is stable against thermal oxidation is prepared by contacting a vinyl ether compound with a Lewis acid in the presence of a polyphenylene oxide to polymerize the vinyl ether compound. Said reaction may be effected in the presence or

absence of a reaction medium, such as aliphatic or alicyclic hydrocarbons or aromatic hydrocarbons or derivatives thereof. The reaction temperature is usually below 140° C. The amount of the Lewis acid is preferably 0.0001 to 10% by weight based on the total amount of the reaction mixture.

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3,586,737

## IMPACT-RESISTANT RUBBER-MODIFIED OLEFINIC NITRILE-ACRYLIC ESTER POLYMERS

June T. Duke, Chagrin Falls, and Dorothy C. Prem, Warrensville Heights, Ohio, assignors to Standard Oil Company, Cleveland, Ohio

No Drawing. Filed Feb. 13, 1969, Ser. No. 799,095
Int. Cl. C08f *15/38*
U.S. Cl. 260—879 10 Claims

Impact-resistant polymers having low permeability to gases and vapors are prepared by polymerizing an olefinic nitrile, such as acrylonitrile, optionally with an olefinic ester, such as methyl acrylate, in an aqueous medium in the presence of a rubbery polybutadiene or rubbery copolymer of butadiene and styrene.

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3,586,738

## ADHESIVE COMPOSITION OF CHLORINE-CONTAINING ELASTOMER WITH o-ALKYL PHENOL-TERPENE RESIN

Henry P. Weymann and Frank V. Miller, Pensacola, Fla., assignors to Tenneco Chemicals, Inc.

No Drawing. Continuation of application Ser. No. 569,025, Aug. 1, 1966. This application June 10, 1969, Ser. No. 832,031
Int. Cl. C08f *29/20*
U.S. Cl. 260—890 5 Claims

The present invention relates to novel adhesive compositions which do not contain a potentially heat hardenable, magnesia reactive resin. The binder of the adhesive composition comprises (1) a polymer of 2-chlorobutadiene-1,3 or another chlorine-containing elastomer and (2) an ortho-alkyl phenol-terpene resin. For each 100 parts of elastomer the binder contains 60 to 150 parts and preferably 70 to 120 parts of the terpene resin.

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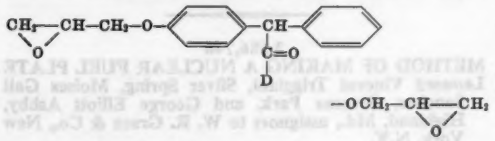
3,586,739

## GLYCIDYL DERIVATIVES OF BIS(HYDROXY-4-PHENYL) ACETIC ACID

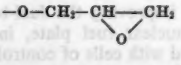
Pierre Talet, Alfortville, and Robert Behar, Paris, France, assignors to Nobel-Bozel, Puteaux, Hauts-de-Seine, France

No Drawing. Continuation-in-part of application Ser. No. 451,340, Apr. 27, 1965. This application July 28, 1969, Ser. No. 845,571
Int. Cl. C08g *45/04*
U.S. Cl. 260—837 9 Claims

Thermosetting acrylic paints utilizing a new group of epoxy compounds which are derivatives of bis(hydroxy-4-phenyl) acetic acid. These epoxy compounds have the formula



wherein D is —O—$R_1$ or



and $R_1$ is an aliphatic hydrocarbon radical of no more than 12 carbon atoms, an alicyclic hydrocarbon radical of no more than 12 carbon atoms or an aromatic hydrocarbon radical of no more than 12 carbon atoms.

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3,586,740

## HIGH IMPACT POLYSTYRENE

Stuart Schott, Cincinnati, Ohio, Stanley P. Rowland, New Orleans, La., and Melvin F. Maringer and Herbert Leonard, Jr., Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 311,198, and Ser. No. 311,199, both Sept. 24, 1963. This application June 3, 1968, Ser. No. 733,783
Int. Cl. C08d *9/08*
U.S. Cl. 260—892 27 Claims

A high impact polystyrene composition is provided which comprises a blend of from 50 to 99.5% by weight of at least one styrene type resin and from 0.5 to 50% by weight of at least one alfin rubber. The styrene type resin can be (1) a polymerized monovinyl aromatic hydrocarbon of the benzene series having the vinyl radical directly attached to a carbon atom of the aromatic nucleus and/or (2) an interpolymer of at least 70% by weight of at least one such monovinyl aromatic hydrocarbon and an alpha-alkyl styrene. The alfin rubber can be (1) a butadiene homopolymer and/or (2) an interpolymer of at least about 45% by weight of butadiene and at least one monomer selected from the group consisting of conjugated aliphatic diene and monovinyl aromatic hydrocarbons of the benzene series. If more than one alfin rubber is present, the alfin rubber polymers include at least a major proportion of a polymer having a molecular weight of from 50,000 to 1,250,000. The impact resistance is further improved if the alfin rubber has a gel content sufficient to render the percentage of gel in the total blend between about 1% and about 25% by weight.

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3,586,741

## MANUFACTURE OF CEMENT AS MELTED FIBERS

Vichtor Immanuel Vognsgaard, Copenhagen-Valby, Denmark, assignor to F. L. Smidth & Co., New York, N.Y.

No Drawing. Filed Feb. 20, 1969, Ser. No. 801,201
Claims priority, application Great Britain, Feb. 28, 1968, 9,427/68
Int. Cl. C04b *7/44*
U.S. Cl. 263—53 12 Claims

A process for the production of hydraulic cement is disclosed in which raw materials are fed dry to a cement kiln in the correct proportions to form cement clinker, the raw materials are burnt, at least the last stage of the burning being at such a high temperature that the burnt product is molten, the product is tapped from the kiln in the form of at least one molten stream, the stream is converted with rapid cooling into the form of fibers of uniform thickness and the fibers are subequently broken up into cement of the desired fineness.

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3,586,742

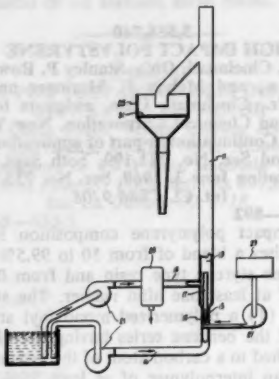
## PROCESS OF PREPARING OXIDE MICROSPHERES

Jack Chin and Roy E. Norman, San Diego, and James H. Thompson, El Cajon, Calif., assignors to Gulf Energy & Environmental Systems, Inc.

Filed Nov. 25, 1966, Ser. No. 597,094
Int. Cl. G21c *21/00*
U.S. Cl. 264—.5 12 Claims

Oxide microspheres are prepared by injecting droplets of an aqueous metal oxide sol into a stream of organic liquid that is substantially immiscible with the sol. Gaseous ammonia is dissolved in the organic liquid, and contact between the liquid stream and the droplets is maintained for a sufficient time to permit the ammonia from the or-

ganic liquid to gel the sol droplets. Uranium-thorium oxide microspheres can be produced using kerosene or carbon



tetrachloride into which gaseous ammonia has been bubbled.

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3,586,743

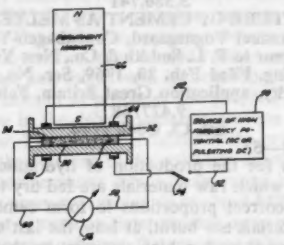
**PROCESS FOR MAKING SOLID STATE CURRENT LIMITERS AND OTHER SOLID STATE DEVICES**

Philippe F. Van Eeck, 11827 Kearsarge St., Los Angeles, Calif. 90049

Continuation-in-part of application Ser. No. 453,089, May 4, 1965. This application July 31, 1967, Ser. No. 657,304

Int. Cl. G21c *21/00*

U.S. Cl. 264—.5 31 Claims



A method for fabricating solid state current limiters and other solid state devices by forming and orienting a plurality of unbalanced dipoles from two groups of conductive particles within a hardenable dielectric matrix by simultaneous application of at least two force fields comprising an electrostatic field and a magnetic field. A third force field obtained from radioactive materials may additionally be utilized. One group of conductive particles is selected from the group of elements having an even number of electrons in its outer shell and having a magnetic moment. The other group of conductive particles is selected from the group of elements having an odd number of electrons in its outer shell. The electrostatic force field is of a time-varying, periodic or pulse waveform, either alternating current or pulsating direct current, and is preferably of a relatively high frequency. The magnetic force field is aroused by either a permanent magnet or an electromagnet and may be shaped to focus the electrostatic force field.

3,586,744

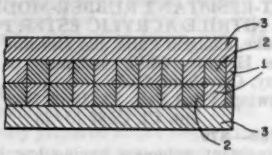
**METHOD OF PREPARING A FUEL PLATE CONTAINING LOW DENSITY FUEL PARTICLES**

Leonard Vincent Triggiani, Silver Spring, Moises Gali Sanchez, Severna Park, and George Elliott Ashby, Highland, Md., asssignors to W. R. Grace & Co., New York, N.Y.

Filed Feb. 28, 1968, Ser. No. 710,707

Int. Cl. G21c *21/00*

U.S. Cl. 264—.5 5 Claims



A process for improving the fuel-bearing phase of a dispersion type nuclear fuel plate, in which individual foils are impressed with cells of controlled dimension and shape in a regular array, and fuel particles having a density of about 50% of theoretical, containing the fissile materials, are inserted in the cells by vibration, compression, suction or other means. The foils are then laminated to additional fuel-bearing foils and outer foils that contain no fissile material and then compressed to yield a unitized fuel plate with the fuel particles dispersed uniformly throughout.

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3,586,745

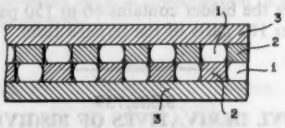
**METHOD OF PREPARING A FUEL PLATE CONTAINING DENSIFIED FUEL PARTICLES**

Leonard Vincent Triggiani, Silver Spring, Moises Gali Sanchez, Severna Park, and George Elliott Ashby, Highland, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Feb. 28, 1968, Ser. No. 710,708

Int. Cl. G21c *21/00*

U.S. Cl. 264—.5 4 Claims



A process for improving the utility of the fuel-bearing phase of a dispersion type nuclear fuel plate, in which individual foils are impressed with cells of controlled dimension and shape in a close-packed array, and dense microspherical fuel particle containing the fissionable materials are inserted in the cells by vibration, compression, suction, or other means. The foils are then laminated to additional plates to yield a unitized fuel plate with the fuel particles dispersed uniformly throughout and with sufficient void space in each of the cells to take care of fission gases and any expansion in individual fuel particles.

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3,586,746

**METHOD OF MAKING A NUCLEAR FUEL PLATE**

Leonard Vincent Triggiani, Silver Spring, Moises Gali Sanchez, Severna Park, and George Elliott Ashby, Highland, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Feb. 28, 1968, Ser. No. 710,709

Int. Cl. G21c *21/02*

U.S. Cl. 264—.5 6 Claims

A process for improving the fuel-bearing phase of a dispersion type nuclear fuel plate, in which individual foils are impressed with cells of controlled dimension and shape in a regular array, and fuel particles containing the fissile materials are inserted into the cells by vibra-

tion, compression, suction, or other means. The foil is then laminated to additional foils to yield a unitized fuel

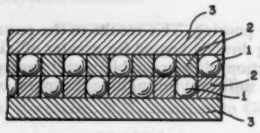


plate with the fuel particles dispersed uniformly throughout.

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**3,586,747**

## METHOD OF OBTAINING STRIPS AND SHEETS OF ZINC AND ZINC ALLOYS

**Schrade F. Radtke, Canaan, Conn., and Giovanni Scacciati, Turin, Italy, assignors to International Lead Zinc Research Organization, Inc., New York, N.Y.**

**Continuation-in-part of application Ser. No. 647,698, June 21, 1967. This application Apr. 9, 1969, Ser. No. 814,707**

**Int. Cl. B22f 3/18**

**U.S. Cl. 264—6** **4 Claims**

A method for preparing sheets or strips of zinc or alloys of zinc by direct rolling of metal particles is disclosed. The size of the particles is preferably above a certain minimum, that is, larger than about 0.2 mm. in the smallest dimension, and the temperature and pressure of the rolling are also above certain minimums, that is, sufficient to effect in a single rolling pass a percent reduction of the metal or alloy of at least about 80% from the original thickness of the compacted particles. A method for the preparation of suitable particles by rotational casting is also disclosed.

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**3,586,748**

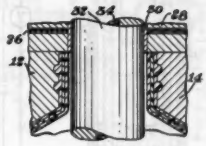
## CONTAINER FORMING METHOD

**Ralph E. Ayres, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Original application Aug. 24, 1966, Ser. No. 574,757, now Patent No. 3,496,597, dated Feb. 24, 1970. Divided and this application Nov. 29, 1968, Ser. No. 807,143**

**Int. Cl. B29c 17/04**

**U.S. Cl. 264—98** **6 Claims**




Method for extrusion forming a preform into a tubular closed end extrusion which is trim-free. In the extrusion process a lug pushes a heated preform through a relatively small aperture in the middle of a die plate, the plug causing the preform to flow from the outside towards the middle of the die plate to form the extrusion through the aperture. The trim-free closed end tubular extrusion can be employed as a parison for a blow molded container having a narrow neck.

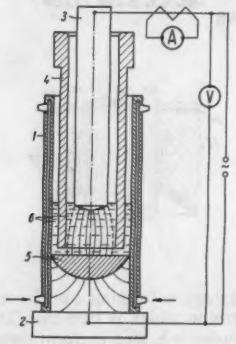
# ELECTRICAL

3,586,749

## METHOD FOR THE ELECTROSLAG WELDING AND BUILDING UP OF METALS AND ALLOYS

Sergei Apollonovich Iodkovsky, N. Kuzminki ulitsa Zelinodolskaya, 17, korpus 3, kv. 59., Moscow; Arseny Nikolaevich Gorozhankin, ulitsa Sharikopodshipnikovskaya 2, kv. 179, Moscow; Anatoly Petrovich Fomichev, ulitsa Textilschiki 4, dom 3, kv. 62, Moscow; Jury Mikhailovich Mironov, prospekt Lenina, 11a, Kv. 17., Cheboxary, and Valery Konstantinovich Proskurovshy, ulitsa Usacheva 29, korpus 2, kv. 130, Moscow, all of, U.S.S.R.

Filed June 20, 1969, Ser. No. 835,169
Int. Cl. B23k *25/00*; H05b *3/60*
U.S. Cl. 13—9 5 Claims




A method is provided for the electroslag welding and building up of metals and alloys which comprises immersing a consumable electrode into a slag bath and passing electrical current to the electrode to produce melting thereof and consequent welding or building up of metal from the electrode, the electrode being surrounded by a shield which is immersed into the slag bath such that its lower end is disposed at least at the level of the tip of the electrode being melted. The shield is isolated from the source of supply of electrical current and serves to concentrate the evolving heat into the slag bath in the interelectrode gap while reducing outward thermal flow.

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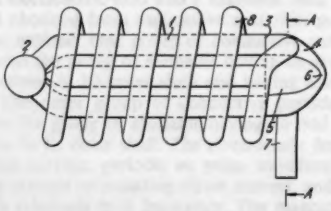
3,586,750

## AUTO TRANSFORMER SILVER BOAT

Henley Frank Sterling, Ware, and Wilbert Ridd George, Harlow, both of, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 7, 1969, Ser. No. 864,511
Claims priority, application Great Britain, Oct. 17, 1968, 49,296
Int. Cl. H05b *5/00, 9/02*
U.S. Cl. 13—27 3 Claims




This is a silver boat apparatus wherein one end of the induction coil is connected to the header of the crucible which is adapted for pouring. This results in the pouring end of the crucible being directly heated for greater efficiency while the remaining portion of the crucible is still heated by eddy currents which is sufficient for melting the metal being treated.

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3,586,751

## CIRCULAR ELECTRIC SERVICE CABLE

Roger J. Schoerner, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Continuation-in-part of application Ser. No. 814,183, Apr. 7, 1969, Continuation-in-part of application Ser. No. 779,376, Nov. 27, 1968, Continuation-in-part of application Ser. No. 730,933, May 21, 1968, now abandoned. This application Apr. 28, 1969, Ser. No. 819,559
Int. Cl. H01b *7/00*
U.S. Cl. 174—115 16 Claims

An electric service cable of substantially circular cross-sectional configuration and including a pair of conductors extending in side-by-side relationship and defining flat juxtaposed surfaces and rounded remote surfaces. Insulation material surrounds the pair of conductors, a stranded tubular sheath surrounds the conductors and their insulating materials, and outside insulation materials surround the tubular conductor. In order to enable the cable to be bent during installation, its conductors are fabricated of aluminum or copper having good elongation properties.

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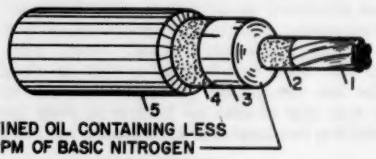
3,586,752

## ELECTRICAL CONDUIT CONTAINING HYDROREFINED OIL

Ivor W. Mills, Media; Glenn R. Dimeler, West Chester, and John J. Melchiore, Wallingford, all of, Pa.

Filed Aug. 18, 1969, Ser. No. 850,779
Int. Cl. H01b *9/06*
U.S. Cl. 174—25 12 Claims




An oil impregnated electrical conduit comprises a conductive metal, a cellulosic insulator, and a hydrorefined insulation oil, wherein the hydrorefined oil has a viscosity in the range of 100—12,000 SUS at 100° F., contains 10—65 weight percent aromatics (by gel analysis) and less than 10 p.p.m. of basic nitrogen (preferably less than 5 p.p.m. and typically less than 2 p.p.m.). Typically, such an oil can contain more than 10 p.p.m. of total nitrogen (e.g., 15—600 p.p.m.) depending on the viscosity of the oil. Preferably, the hydrorefined oil is naphthenic or aromatic (by VGC classification). A preferred conduit is an oil-filled electrical cable wherein the cellulosic insulator is paper and is wrapped around the conductive metal. A preferred paper is capacitor

grade Kraft paper of relatively high density and can be creped or microcreped. The cellulosic insulator can also comprise chemically treated cellulose such as cyanoethylated cellulose or acetylated cellulose.

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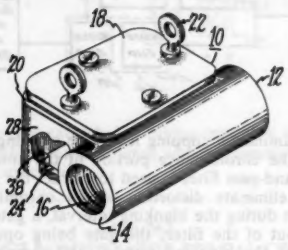
3,586,753

## SECONDARY TERMINAL CONDUIT BOX FOR CURRENT TRANSFORMERS

John A. Smith, Rochester, N.H., assignor to General Electric Company

Filed Sept. 19, 1969, Ser. No. 859,321
Int. Cl. H02g 3/08
U.S. Cl. 174—50 5 Claims




A conduit box for mounting over the secondary terminals of a current transformer. An insulated retainer member is provided which fits over the secondary terminals and is secured thereto by use of E-rings, fitting in grooves in such secondary terminals. The conduit box has ledges on the inside walls which cooperate with notched portions of the retainer member to hold the conduit box securely in place over the secondary terminals.

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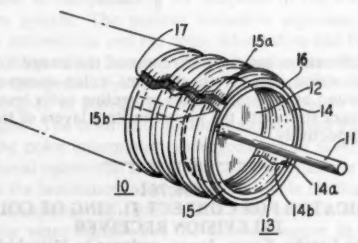
3,586,754

## LAMINATED CORRUGATED COAXIAL CABLE STRUCTURE AND METHOD FOR MAKING

David J. Meskell, Jr., Ellicott City, Md., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed July 24, 1969, Ser. No. 844,347
Int. Cl. H01b 7/20, 11/18
U.S. Cl. 174—106 5 Claims



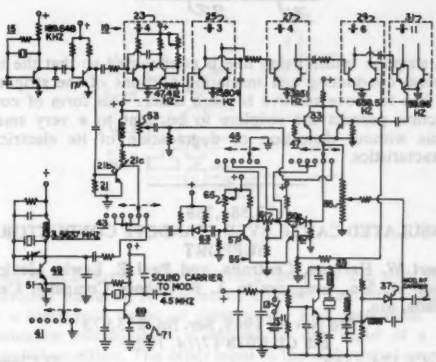

The outer conductor of a coaxial cable is made by separately corrugating a steel tape and a copper-steel strip in two mated and contiguous mills. The formed members are then edge-registered with the steel tape overlapping the strip; and tubed together to butt the steel tape edges. These thereafter are soldered closed. Advantageously the strip edges are 180° removed from the solder joint.

3,586,755

## TEST SIGNAL GENERATOR

Steven Wlasuk, Blackwood, N.J., assignor to RCA Corporation

Filed Jan. 30, 1968, Ser. No. 701,729
Int. Cl. H04n 5/06
U.S. Cl. 178—5.4 TE 12 Claims




Test signal generating apparatus for providing color bars, dots, lines and crosshatch patterns for television receiver servicing. Color bars are produced by means of an internally generated color subcarrier offset from the standard broadcast color subcarrier by the line scanning frequency employed in the generator. Dots, vertical lines, horizontal lines and a crosshatch pattern are provided by means of pulse trains having pulse repetition rates integrally related to each other and to the line and field rates employed in the generator.

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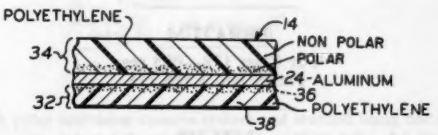
3,586,756

## ELECTRICAL CABLE WITH PROTECTIVE COATING OR SHIELDING TAPE

Oscar G. Garner, Riverside, Conn.; Ludwik Jachimowicz, Elizabeth, and Joseph B. Masterson, Carteret, both of, N.J., assignors to General Cable Corporation, New York, N.Y.

Continuation of application Ser. No. 627,082, Mar. 30, 1967.
This application Apr. 30, 1969, Ser. No. 820,587
Int. Cl. H01b 7/28
U.S. Cl. 174—107 10 Claims

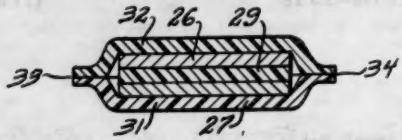



In order to obtain the tenacious adherence of polyethylene copolymer without the cost of the copolymer, this cable has polyethylene protection on the metal foil of the shielding layer with the polyethylene a homopolymer throughout a substantial part of its thickness and changing to copolymer characteristics adjacent to the face of the foil.

## 3,586,757
## FLEXIBLE STRIPLINE TRANSMISSION LINE

Merle Haldeman, Jr., Downers Grove, Ill.

Filed Aug. 14, 1969, Ser. No. 850,151
Int. Cl. H01b 7/08
U.S. Cl. 174—117 FF 4 Claims

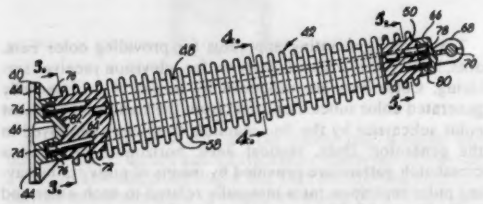



A stripline transmission line is constructed so that the individual conducting and insulating portions of the stripline are free to move relative to each other. This form of construction permits the stripline to be bent to a very small radius without distortion or degradation of its electrical characteristics.

## 3,586,758
## INSULATED CANTILEVER STANDOFF CONDUCTOR SUPPORT

Robert W. Harmon, Centralia, and Paul E. Lewis, Mexico, both of, Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Nov. 4, 1969, Ser. No. 873,973
Int. Cl. H01b 17/14, 17/60
U.S. Cl. 174—158 23 Claims



A cantilever standoff for supporting a conductor in laterally spaced relationship to a line pole. A base member is attached to the pole and a standoff arm extends outwardly therefrom, its outboard end being provided with a suitable conductor support. The arm has a tapered, insulating body of synthetic resin material of progressively greater cross-sectional area toward the base member, and one or more longitudinally extending, load-bearing rods of uniform individual cross section are disposed within the body to increase its tensile strength and, in some forms of the construction, its compressive strength as well. The rods are composed of a synthetic resin that is longitudinally reinforced by glass fibers, the ends of the rods being rigidly anchored in the base member and the outboard conductor support. The body is provided with a series of integral skirts over its length to increase resistance to flashover. The base member may be specially configured to transmit shear stresses thereto.

## ERRATUM

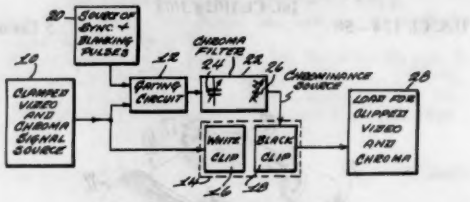
For Class 178—005 see:
Patent No. 3,586,755

## 3,586,759
## VIDEO CLIPPER CHROMA

John D Ross, Dollard Des Ormeaux, Quebec, Canada, assignor to Central Cynamics, Ltd., Pointe Claire, Montreal, Quebec, Canada

Continuation-in-part of application Ser. No. 626,520, Mar. 28, 1967, now abandoned. This application Nov. 13, 1967, Ser. No. 691,667
Int. Cl. H04n 9/48
U.S. Cl. 178—5.4 19 Claims

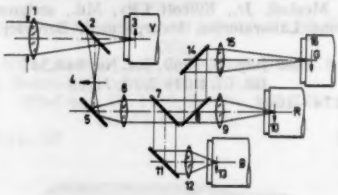
Solid state circuitry for clipping a television composite (luminance plus chrominance) color signal is disclosed whereby the amplitude of the luminance signal is limited to preset voltage levels corresponding to blanking level and peak white without clipping the chrominance signal which for certain saturated colors exceeds the luminance clipping level. The circuitry modulates the clipping circuit with chrominance information of precisely the same phase and amplitude as the chrominance modulation on the video signal so that the clipping circuit is desensitized during excursions of the chrominance modulation to values more negative than the black clip level. Thus, whenever the chrominance signal exceeds the luminance clipping level, the clipping circuit does not affect the chrominance portion of the composite color signal. A band-pass filter is used to extract the chrominance signal. To eliminate distortion of the chrominance signal filter output during the blanking interval, a gate is provided at the output of the filter, the gate being operated at the beginning of the blanking interval and thereby effectively preventing any distortion from reaching the clipping circuitry during this time.




## 3,586,760
## COLOR TELEVISION CAMERA GENERATING UNIFORM LAG COLOR COMPONENT SIGNALS

Wolfgang Dillenburger, Niederramstadt near Darmstadt, Germany, assignor to Fernseh G.m.b.H., Darmstadt, Germany

Filed Sept. 25, 1968, Ser. No. 762,393
Claims priority, application Germany, Sept. 26, 1967, P 15 97 211.9
Int. Cl. H04n 9/08
U.S. Cl. 178—5.4 11 Claims



The different color responsiveness of the image tubes of a color television camera to different color components is compensated by different lenses projecting color images having different sizes onto the photosensitive layers of the image tubes, respectively.

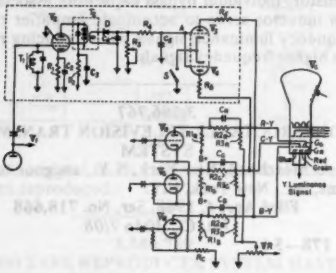
## 3,586,761
## INDICATOR FOR CORRECT TUNING OF COLOR TELEVISION RECEIVER

Katsuhito Uetake, Kyoto, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1968, Ser. No. 775,609
Claims priority, application Japan, Nov. 15, 1967, 42/73540
Int. Cl. H04n 9/12
U.S. Cl. 178—5.4 6 Claims

A video intermediate frequency amplifier is connected to a frequency selective amplifier to amplify the video intermediate frequency signal. The amplified signal is rectified by a diode to form a DC signal after which it is applied through a control dual triode to selected two of three guns of a

tricolor cathode-ray tube at the grid electrodes. The DC signal has a magnitude sufficient to put the control triode in its nonconducting state for detuning or correct tuning of the



receiver. Thus the cathode-ray tubing produces images having only a single color associated with the remaining gun for detuning or correct tuning.

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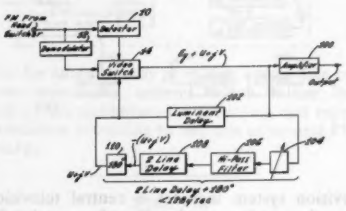
**3,586,762**

## DROPOUT COMPENSATOR FOR PAL COLOR TELEVISION

**Frederick J. Hodge, and Ralph R. Barclay, both of Camarillo, Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Feb. 3, 1969, Ser. No. 796,082**
**Int. Cl. H04n** *5/42*
**U.S. Cl. 178—5.4** **20 Claims**



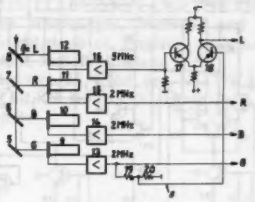
The present invention is directed to a dropout compensator for use in compensating for dropouts in the PAL color television system. The present invention separates the luminance information and the color information and feeds the separate information into two channels and operates on these channels independently. Specifically, the luminance information is delayed to provide for a luminance dropout compensating signal. The color information is also delayed but, in addition, the color information undergoes one of several types of functional operations so that the color information may be added to the luminance information to provide for the proper dropout compensating signal which may be substituted for the regular video signal when the dropout occurs. In one example of the invention, the color information is delayed for approximately a two-line period and then phase shifted in order to provide for the proper color dropout signal. In a second embodiment of the invention, the color signal is delayed and passed through a conjugate function generator to average out the errors over two lines and the color signal is then passed through a final one-line delay. In a final embodiment of the invention, the color signal is delayed a single line and is then modulated to produce the proper color dropout signal.

**3,586,763**

## BEAM SPLITTING MEANS FOR COLOR TELEVISION CAMERAS

**Hans-Dieter Schneider, Gross-Gerau, Germany, assignor to Fernseh G.m.b.H., Darmstadt, Germany**

**Filed Feb. 14, 1969, Ser. No. 799,386**
**Claims priority, application Germany, Feb. 14, 1968, P 15 37 940.5**
**Int. Cl. H04n** *9/08*
**U.S. Cl. 178—5.4 TC** **10 Claims**



An optical beam splitting arrangement for use with color television cameras, A luminance channel transmits a signal for a luminance image of substantially high resolution. The luminance image signal is applied to one input of a differential amplifier. The other input to the differential amplifier is derived from covering image channels of substantially lower resolution. The arrangement is such that the luminance characteristic is made substantially identical to the theoretically correct characteristic while, at the same time, realizing a contour enhancement.

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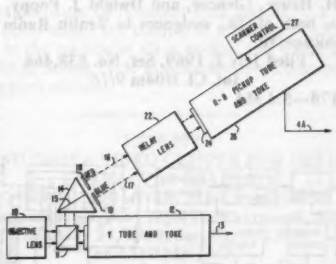
**3,586,764**

## T.V. CAMERA EMPLOYING A LIMINANCE PICKUP TUBE AND A COLOR PICKUP TUBE FOR MULTIPLEXED RED AND BLUE SIGNALS

**Max H. Diehl, Manlius, and Halfon N. Hamaoui, Fayetteville, both of, N.Y., assignors to General Electric Company**

**Filed Feb. 25, 1969, Ser. No. 802,003**
**Int. Cl. H04m** *9/08*
**U.S. Cl. 178—5.4 ST** **5 Claims**

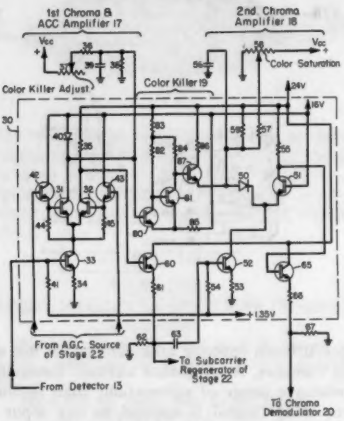


A color television camera system and method using one luminance pickup tube and one color pickup tube. An input image beam is split between the luminance tube and the optics for the color pickup tube. The color portion of the input beam is split in a Kosters prism to provide two output beams, one of which is inverted relative to the input beam. The output beams form two side-by-side images on the color tube. A video scan line sequentially covers one of the two images in a forward direction and the other in a reverse direction to generate a line-sequential video signal. A sequencer receives this video signal and provides continuous output video signals representing two colors.

## 3,586,765
## CHROMA AMPLIFIER FOR A COLOR RECEIVER

Howard F. Jirka, Riverside, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed June 27, 1969, Ser. No. 837,022
Int. Cl. H04n 9/48
U.S. Cl. 178—5.4 17 Claims


1st Chroma & ACC Amplifier 17
2nd Chroma Amplifier 18
Color Killer Adjust
Color Killer 19
Color Saturation
From AGC Source of Stage 22
To Subcarrier Regenerator of Stage 22
From Detector 15
To Chroma Demodulator 20

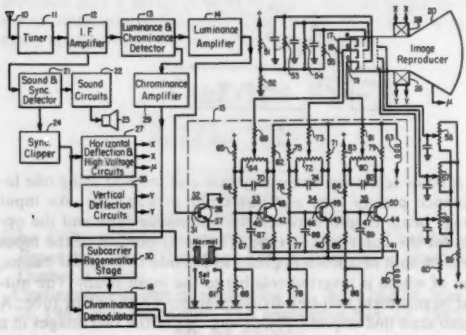
A chroma amplifier and color killer has three transistor devices arranged in a Y-type circuit with two of the devices defining a cascode amplifier while the three collectively define a differential amplifier. Another cluster of similar devices define a second cascode amplifier which is in cascade with the first and further define a second differential amplifier. The chroma signal is amplified in both cascode amplifiers for delivery to the color demodulator.

A color killer connects between the two differential amplifiers and has a threshold which is exceeded when the gain of the first cascode amplifier is above a particular value. Upon such occurrence, the color killer disables the second differential amplifier to interrupt translation of the chroma signal.

## 3,586,766
## MATRIX AMPLIFIER

Charles H. Heuer, Glencoe, and Dwight J. Poppy, Arlington Heights, both of, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed July 2, 1969, Ser. No. 838,466
Int. Cl. H04m 9/18
U.S. Cl. 178—5.4 MA 13 Claims

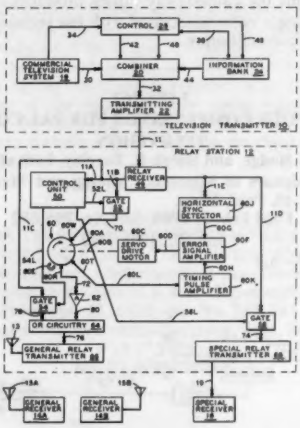



A three transistor matrix amplifier is described for combining three color-difference signals from a chrominance demodulator with a luminance signal to form suitable color-control drive signals for a three-gun image reproducer. Each of the three-matrix amplifier transistors has a novel collector circuit which permits its output to be varied without affecting the setup of the image reproducer, and which simultaneously establishes a feedback circuit for stabilizing the operation of the transistor. Individual bypass capacitors associated with a common inductor serve to accentuate amplifier response to high frequency luminance signals while reducing response to spurious higher frequency signals.

## 3,586,767
## RECONSTRUCTABLE TELEVISION TRANSMISSION SYSTEM

Charles A. Morchand, New York, N.Y., assignor to Data-Plex Systems, Inc., New York, N.Y.

Filed Apr. 4, 1968, Ser. No. 718,668
Int. Cl. H04n 7/08
U.S. Cl. 178—5.6 6 Claims




A television system includes a central television transmitter, a relay station, a plurality of general information receivers and a plurality of special receivers. The central transmitter transmits at least fields of general user information interplexed with fields of special user information to the relay station. The relay station selects the fields of special user information for transmission to the special receivers and also substitutes for such fields adjacent fields of general user information so that a continuous stream of general user information can also be transmitted to the plurality of general information receivers.

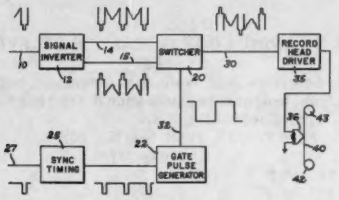
## 3,586,768
## MAGNETIC RECORDING AND REPRODUCTION WITH POLARITY INVERSION DURING ALTERNATE LINE PERIODS

Kingston E. Ganske, Columbus, Ind., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed June 8, 1966, Ser. No. 556,099
Int. Cl. H04n 5/78, 7/12
U.S. Cl. 178—6.6 6 Claims

A process and apparatus are disclosed for magnetically recording and producing electrical signals of a frequency range from DC to several megacycles. The signal to be recorded is first regularly inverted at a rate corresponding to a chosen frequency within the optimum range of the recording media and associated recording and playback transducers, producing a signal to be recorded which is regularly inverted and noninverted at such chosen rate. This signal is

recorded on a magnetic recording media, is later played back, and upon playback the inverted portions are restored




to recreate the signal in its original form, and the restored signal is then reproduced.

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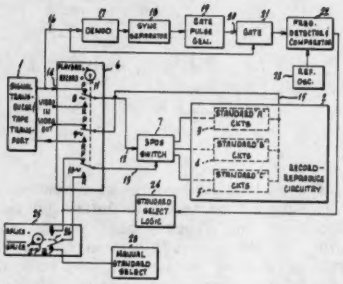
3,586,769

## A VIDEO TAPE REPRODUCER SYSTEM HAVING AUTOMATIC STANDARD SELECTION

**Arch Luther, Jr., Cherry Hill, and John C. Kmiec, Runnemede, both of, N.J., assignors to RCA Corporation**

**Filed Nov. 12, 1968, Ser. No. 774,862**
**Int. Cl. G11b** *5/04, 27/28;* **H04n** *5/78*
**U.S. Cl. 178—6.6A** **9 Claims**




A device for automatically providing compatible operation of recorder-reproducer systems which utilize frequency modulation (FM) techniques for recording and reproducing video information according to any one of several FM deviation standards.

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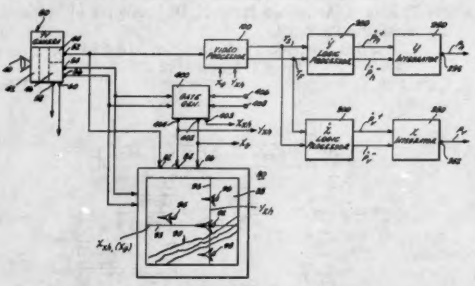
3,586,770

## ADAPTIVE GATED DIGITAL TRACKER

**Robert L. Bonebreak, Los Angeles, and William A. Chambers, Torrance, both of, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.**

**Filed Aug. 30, 1967, Ser. No. 664,547**
**Int. Cl. H04m** *3/14*
**U.S. Cl. 178—6.8** **15 Claims**



A system for distinguishing a designated object in space from objects of similar intensity within the receiving aperture of a TV (television) camera and for determining the location thereof. A video processor, coupled to the TV camera limits the system's response to signals representative of the inner intensity contour of possible targets. A digital processor, in response to the video processor output signals, determines the difference between the angular location of the designated object and a previously stored estimate of this position and updates the stored position. The updating function of the digital processor is normalized by the target's image dimensions so that the tracking response of the system is essentially independent of target image size.

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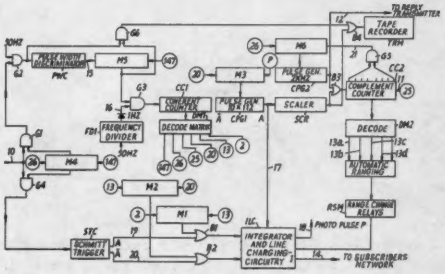
3,586,771

## SUBSCRIPTION TELEVISION AND THE LIKE SYSTEMS

**Gerhart Lothar Hamburger, Welwyn, and Joseph James Osborne, Enfield, both of, England, assignors to Sangamo Weston Limited, Enfield, England**

**Filed Oct. 25, 1968, Ser. No. 770,570**
**Int. Cl. H04b** *1/00;* **H04h** *7/16*
**U.S. Cl. 178—6.8** **15 Claims**




A subscription television or radio signal distribution system in which program signals are supplied over a wire conductor network from a master station to a plurality of subscribers along with periodic price signals for controlling the monetary charge to be levied for any particular program and in which means are also provided for measuring and registering the number of active subscribers accepting any program, the said program signals being supplied through a number of slave stations which each deal with a different group of subscribers and in which each slave station performs, at regular repeated intervals, a predetermined program of operations connected with the measurement of the number of active subscribers and the transmission of resultant data signals to a common recording point under the control of a timing clock which is individual to the particular slave station and which is caused to start a fresh timing cycle in response to a command signal from the master station.

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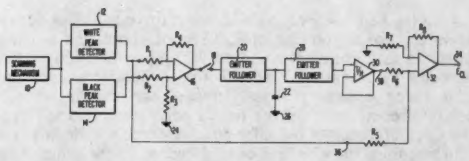
3,586,772

## SECOND ORDER VIDEO CLIPPER FOR OPTICAL CHARACTER READER

**William W. Hardin, Stewartville, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 24, 1968, Ser. No. 731,889**
**Int. Cl. H04n** *1/00*
**U.S. Cl. 178—7.1** **5 Claims**




An optical character reader providing output signals proportional to the lightness or blackness of the document being

scanned generates a clipping level voltage which is not a fixed percentage of the peak black minus peak white signals. The clipping level percentage varies with the density, or blackness, of the character. The black and white peak signals are applied to a differentially connected operational amplifier having an output proportional to a first multiple times the black peak minus a second multiple times the white peak, where the first and second multiples are unequal. The output of the operational amplifier is added to a signal proportional to white background thereby providing a clipping level which is a variable percentage of the difference between a black and white peak signal.

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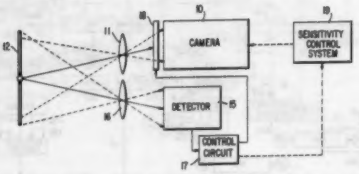
**3,586,773**

**TELEVISION IMAGE TUBE PROTECTION SYSTEM**

**Le Roy L. Niemyer, Jr., Baltimore, and Edgar L. Irwin, Glen Burnie, both of, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Feb. 24, 1969, Ser. No. 801,504**
**Int. Cl. H04n** *5/26*
**U.S. Cl. 178—7.2** **9 Claims**




A protective system for a television camera tube includes photosensitive means, independent of the camera tube, responsive to the level of illumination in the scene scanned by the camera tube. The detector is responsive to point sources of illumination in the scene, independently of the average scene illumination, for producing a control signal to actuate protection means for the camera tube when any such point source approaches a level of illumination which would damage the camera tube.

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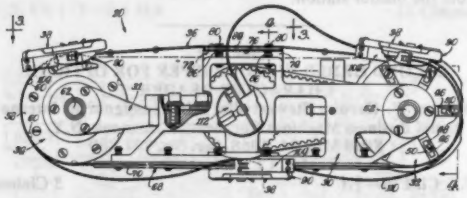
**3,586,774**

**FACSIMILE OPTICAL SCANNER ASSEMBLY**

**Frans Brouwer, Glencoe, and Frank L. Sobchak, Chicago, both of, Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.**

**Filed June 25, 1968, Ser. No. 739,745**
**Int. Cl. H04n** *1/14*
**U.S. Cl. 178—7.6** **14 Claims**



A timing belt assembly trained about drive and idler pulley assemblies for supporting optical scanner units and moving the same in a continuous closed path upon rotation of the drive pulley assembly. The effective circumference of the drive pulley assembly is slightly greater than one-third the effective circumference of the timing belt assembly; the effective circumference of the idler pulley assembly is slightly less than one-third the effective circumference of the timing belt assembly; biasing means impose a lateral force on the timing belt assembly for maintaining the latter under substantially constant tension; and the cylindrical face means of the idler pulley assembly, about which the timing belt assembly, comprised of endless flexible tape means, is trained, has an axial extent at least equal to the width of the tape means.

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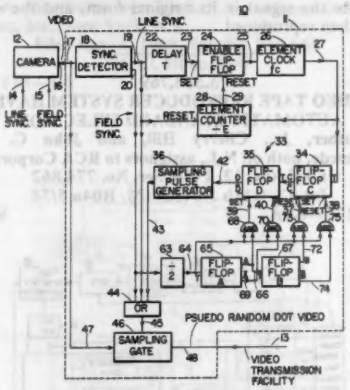
**3,586,775**

**PSEUDO-RANDOM DOT INTERLACE TELEVISION SYSTEM**

**Edward S. Smierciak, and Wallace R. Neumann, both of Fort Wayne, Ind., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.**

**Filed Feb. 28, 1968, Ser. No. 708,933**
**Int. Cl. H04n** *1/36*
**U.S. Cl. 178—69.5** **9 Claims**




In a raster-type television system which includes a signal source generating a time based dot interlaced video signal having recurrent line synchronizing signals and frame synchronizing signals, a pseudo-random dot interlace-sampling system is provided for sampling and transmitting the sampled dot interlaced signal in a pseudo-random manner. The pseudo random dot interlace sampling system includes a source generating a train of timing signal pulses in response to the line synchronizing signals, a signal source generating a train of recurrent sampling signal pulses having a certain predetermined frequency relationship with various parameters of the system, an interlace counter for actuating the sampling signal pulse-generating source, a circuit for setting the interlace counter to a different predetermined initial count of the timing signal pulses in response to each frame-synchronizing signal, and gating circuit responsive to the sampling signal pulses for sampling and transmitting the sampled train of sequential dot interlaced video signals.

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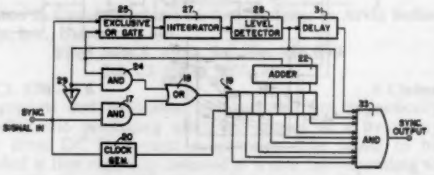
**3,586,776**

**DIGITAL COMMUNICATION SYNCHRONIZATION SYSTEM INCLUDING SYNCHRONIZATION SIGNAL TERMINATION RECOGNITION MEANS**

**Roger F. Salava, Arlington Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.**

**Filed Apr. 16, 1969, Ser. No. 816,654**
**Int. Cl. H04n** *1/36*
**U.S. Cl. 178—69.5 R** **7 Claims**




A shift register in a receiving unit uses a feedback to develop a digital code and the digital code is compared with

an incoming digital code used to synchronize a digital communication signal. Initially the shift register is fed the incoming digital code signal. If the received and generated signals are in agreement an output signal is added in an integrator for each agreement. If the signals do not agree the output signal is subtracted from the signal stored in the integrator. When the signal stored in the integrator reaches a predetermined level a switching action occurs which connects the feedback output of the shift register to the input of the shift register so that the code is self-generating and errors in the incoming code will not be coupled into the shift register.

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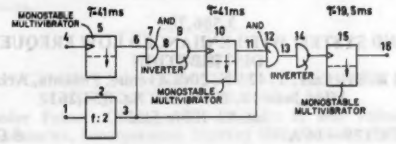
**3,586,777**

## METHOD AND ARRANGEMENT FOR GENERATING A GATING PULSE

**Gerhard Kamin, Traisa, Darmstadt, Germany, assignor to Fernseh GmbH, Darmstadt, Germany**

**Filed Aug. 28, 1969, Ser. No. 853,780**
**Claims priority, application Germany, Sept. 7, 1968, P 17 62 841.0**
**Int. Cl. H04n *5/04***
**U.S. Cl. 178—69.5 TV** **12 Claims**




Vertical frequency pulses in a television signal are frequency divided by a factor of two. In response to a control signal, a first timing signal is generated extending for a time slightly exceeding the length of time corresponding to a frame in the television signal. The frequency divided signal and the first timing signal are fed to the inputs of a series combination of AND gate and inverter. The trailing edge of the output pulse furnished by the series combination triggers a monostable multivibrator whose output pulse extends for the same time as the first timing signal. This pulse and the frequency divided pulses are again fed to an AND gate-inverter combination whose output triggers a third monostable multivibrator.

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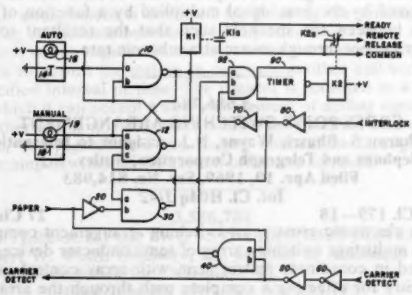
**3,586,778**

## DATA SET ADAPTER

**Alton F. Riethmeier, Rochester, and Frank R. Fahey, Pittsford, both of, N.Y., assignors to Xerox Corporation, Rochester, N.Y.**

**Filed Dec. 23, 1968, Ser. No. 786,165**
**Int. Cl. H04m *11/06***
**U.S. Cl. 179—2** **4 Claims**




A data set adapter for coupling a facsimile transmission unit to a data set for use in transmitting facsimile information between locations over a direct-distance-dialing common carrier telephone line. By the means of logic and timing circuits, interfacing is accomplished between a facsimile communication unit and a data set coupled to the transmission line terminal. With such a data set adapter the facsimile communication system can be operated in a manual or automatic mode for attended or unattended operation.

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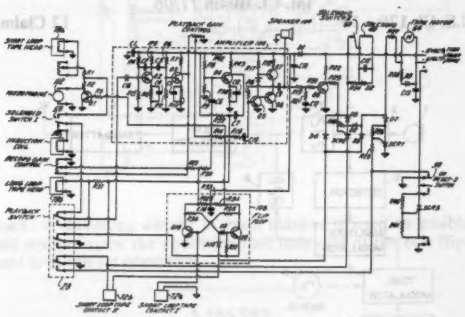
**3,586,779**

## TELEPHONE ANSWERING DEVICE WITH SOLENOID COUPLER

**M. Philip Chernack, 399 June Place, West Hempstead, N.Y., and Arthur L. Zimmet, 203 East 76th St., New York, N.Y.**

**Filed Jan. 8, 1969, Ser. No. 789,674**
**Int. Cl. H04m *1/64***
**U.S. Cl. 179—6** **12 Claims**



A telephone-answering device with recording and playback features. The device is placed on a standard telephone receiving and transmitting apparatus, and is electrically independent of the telephone circuit. When actuated by a ringing signal, the device transmits a prerecorded message to the caller. Afterward, the device will record any spoken message from the calling party in response to the prerecorded message. The recorded messages from the calling party may be played back, at will, at the telephone-receiving apparatus.

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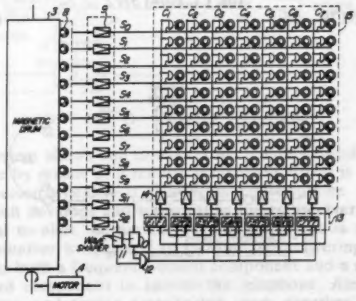
**3,586,780**

## AUTOMATIC TELEPHONE NUMBER INFORMATION SYSTEM

**Eiji Kezuka, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed July 7, 1969, Ser. No. 839,439**
**Claims priority, application Japan, July 11, 1968, 43/49456**
**Int. Cl. H04m *3/50***
**U.S. Cl. 179—6** **5 Claims**




The present invention relates to a device for automatically informing a calling subscriber that the telephone number he wishes to contact has been changed; wherein when a subscriber is calling another subscriber and is unaware of the change, the calling subscriber is automatically informed of

the changed or newly allotted number; wherein the setting and the modification of any individual number to be informed can be easily performed; and wherein the information of a plurality of changed or newly allotted numbers for many subscribers can be achieved through the use of a single device.

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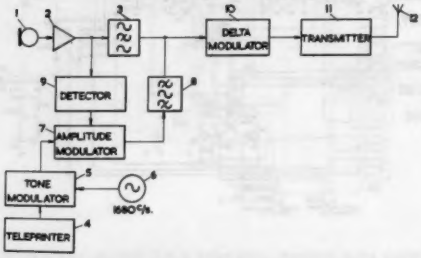
**3,586,781**
**TELECOMMUNICATION APPARATUS**

**Elwyn T. Jones, Christchurch, England, assignor to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England**

**Continuation of application Ser. No. 661,877, Aug. 21, 1967, now abandoned. This application May 19, 1970, Ser. No. 37,482**
**Int. Cl. H04m** *11/06*
**U.S. Cl. 179—15** **12 Claims**




In telecommunications apparatus for transmitting a speech signal and at least one digital data signal in different frequency ranges over a common channel, the amplitude of the data signals is made to follow the mean amplitude of the speech signal. An amplitude limiter circuit may be provided in the speech signal path; the amplitude-limiting action of this circuit is preferably controlled by a signal derived from a sample or simulation of the intermodulation, distortion and noise-producing effects of the common channel. A controllable amplitude-limiter circuit is described.

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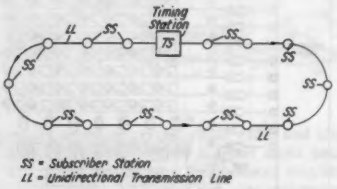
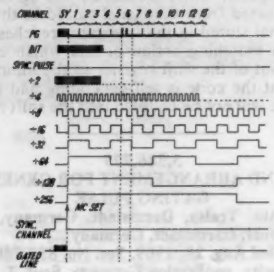
**3,586,782**
**TELECOMMUNICATION LOOP SYSTEM**

**David Lane Thomas, Bishop's Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.**

**Filed Sept. 30, 1968, Ser. No. 763,874**
**Claims priority, application Great Britain, Oct. 25, 1967, 48466/67**
**Int. Cl. H04j** *3/12*
**U.S. Cl. 179—15** **6 Claims**




A communication network is described in which a group of subscribers have access to a unidirectional closed loop transmission line arranged for the continuous unidirectional circulation of TDM PCM signals. Subscribers on the same closed loop line communicate by seizing a free time slot in the TDM sequence. Association of one closed loop line with another through signal transfer centers sets up longer links through two or more closed loop lines. The network can handle




coded data, television, facsimile or the like in addition to coded speech.

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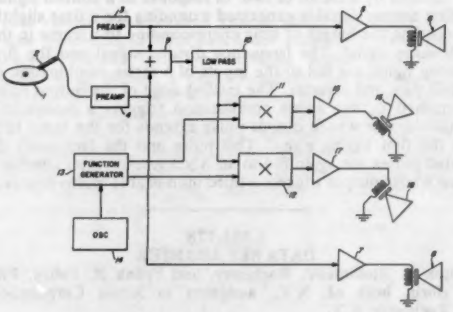
**3,586,783**
**SOUND SYSTEM WITH ENHANCED LOW FREQUENCY DISTRIBUTION**

**David R. Brickner, 17423 N. 20th Avenue, Phoenix, Ariz.**

**Filed June 18, 1969, Ser. No. 834,261**
**Int. Cl. H04r** *5/02*
**U.S. Cl. 179—16 A** **8 Claims**




In order to achieve an augmented apparent bass in a sound system, a pair of low frequency speakers are oriented at a predetermined angle with respect to one another and each is energized by the bass signal multiplied by a function of the angle between the speakers such that the resultant sound vector sweeps through an arc at a subsonic rate.

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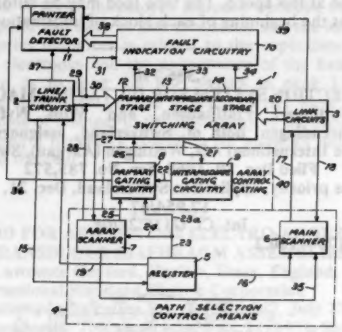
**3,586,784**
**CROSS-POINT-SWITCHING ARRANGEMENT**

**Gurcharan S. Bhusri, Wayne, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.**

**Filed Apr. 10, 1969, Ser. No. 814,983**
**Int. Cl. H04q** *3/42*
**U.S. Cl. 179—18** **27 Claims**

An electronic cross-point-switching arrangement comprising a multistage switching array of semiconductor devices arranged in coordinate matrix form with array control-gating circuitry for effecting a complete path through the array at very high speeds. Selection and activation of cross-points is such as to involve only the minimum number of cross-points necessary to establish this connection. The control-gating circuitry permits simultaneous automatic searching of all available switching possibilities through the array and prevents the activation of any cross-point in a connection attempt when

no idle paths exist. Fault indication circuitry is provided for the detection of cross-point failures, the output information




therefrom being readily adaptable to permanent recording apparatus.

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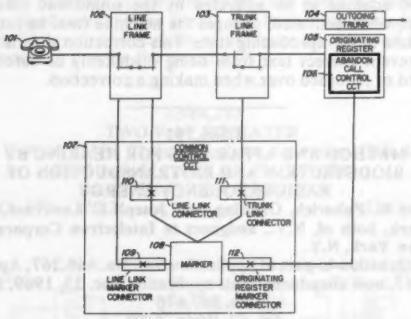
**3,586,785**

## ARRANGEMENT FOR PROCESSING ABANDONED AND SUBSEQUENTLY INITIATED CALLS

**Alexander Feiner, Chicago, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed May 9, 1969, Ser. No. 823,258**
**Int. Cl. H04q** *3/22*
**U.S. Cl. 179—18 F** **18 Claims**




An arrangement is disclosed for delaying the release of a dialing connection between a calling telephone station and a central office register when the station prematurely disconnects to permit the station to originate another call within a specified interval of time. The register is returned to a state in which it can accept a new complement of dialing signals. If another call is not originated within the specified interval of time, the register and the dialing connection through the switching network of the central office are released.

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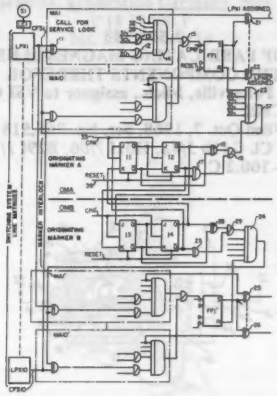
**3,586,786**

## INTERLOCK FOR TWO ASYNCHRONOUS SYSTEMS

**Robert W. Wolff, Lombard, Ill., assignor to Automatic Electric Laboratories, Inc., Northlake, Ill.**

**Filed June 20, 1969, Ser. No. 835,175**
**Int. Cl. H04q** *3/18*
**U.S. Cl. 179—18 FG** **5 Claims**

A telephone switching system matrix arrangement having two originating markers available to serve lines calling for service. Those portions of the two markers responsive to a call for service are shown and include an enabling interlock circuit. A part of this circuit is located in each marker. This circuit consists of a modified ring counter having two flip-flops in each marker that are operated by that marker's clock. A decoding circuit in each marker is used to enable that marker upon the condition that only one of the two flip-flops is in the set condition.



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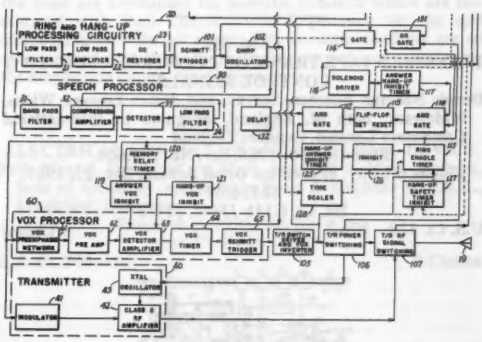
**3,586,787**

## REMOTE TELEPHONE EXTENSION SYSTEM

**Joseph Herbert Vogelman, Roslyn, N.Y.; Kenrick O. Stephenson, Jr., Montclair, N.J., and Bernard Feinerman, Suffern, N.Y., assignors to Chromalloy American Corporation, West Nyack, N.Y.**

**Division of Ser. No. 503,285, Pat. No. 3,476,882. Filed July 22, 1969, Ser. No. 843,521**
**Int. Cl. H04q** *7/04*
**U.S. Cl. 179—41 A** **2 Claims**




The system allows one to answer his telephone and talk to the caller by means of a remote transceiver which is carried by the person when he is away from his telephone. A base station unit develops and transmits to the transceiver a ringing signal to alert the person that his telephone is ringing. The transceiver is operated to transmit an answering signal which has both a frequency-coded component and a speech-modulated component to answer the telephone. Amplitude comparison and timing circuits are used, together with a frequency analyzer to prevent unwanted answering of the telephone. Means are provided for terminating the call in response to either hanging up the calling telephone, receipt of a dial tone, or receipt of a warning signal on the telephone after hangup. Also, means are provided for automatic hangup after a period of time in which no coded signal from the

remote transceiver or voice signals from the caller are received. Remote dialing means are provided in which the answering circuitry is used in the initiation of calls from the remote transceiver, as well as in the answering of incoming calls.

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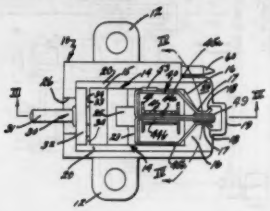
**3,586,788**

## METHOD OF FABRICATING MAGNETIC HEADS AND THE COMPONENTS THEREFOR

Leo W. Page, Potterville, Mich., assignor to VSI Corporation, Pasadena, Calif.

Filed Oct. 7, 1968, Ser. No. 765,518
Int. Cl. G11b *5/42*; H01f *7/06*; B29f *1/10*
U.S. Cl. 179—100.2 C 13 Claims



A magnetic erase head formed by providing a housing having a bottom, side and end walls. The housing has integrally formed therein structural members operative to positively position and retain the transducing apparatus in a predetermined position after it has been placed therein. These structural members, in accordance with the preferred embodiment of this invention, comprise converging sections of the sidewalls which form a necked-down slot into which the core, separator and pole segments are tightly positioned. After the transducing apparatus is so positioned, the panlike housing is poured full of potting compound. The imperforate nature of the housing prevents the compound from leaking and, consequently, it may be poured full and thereafter permitted to solidify in any convenient place. Subsequent to solidification of the potting compound, the forward wall of the housing and a portion of the pole pieces utilized in the positioning process are removed by grinding or the like to form the pole faces.

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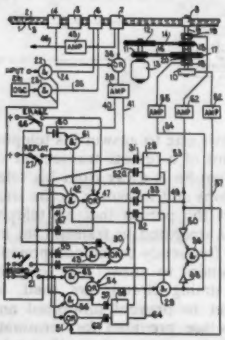
**3,586,789**

## TWO-SPEED TAPE TRANSPORT CONTROL USING TWO CONTROL SIGNALS

Dennis Norman Butcher, Surrey, and James Edward Wicks, Middlesex, both of, England, assignors to International Computers Limited, London, England

Filed Dec. 18, 1968, Ser. No. 784,604
Claims priority, application Great Britain, Dec. 23, 1967, 58576/67
Int. Cl. G11b *15/44*, *15/02*
U.S. Cl. 179—100.2 4 Claims



Apparatus for feeding a loop of magnetic tape is described in which signals recorded in a control track coextensively with information signals recorded in an information track are utilized to control the tape feed so that during recording or playback of a block of information signals, the tape is fed at slow speed and between blocks of information signals the tape is fed at fast speed. The tape feed may be automatically stopped at the beginning of each block of information.

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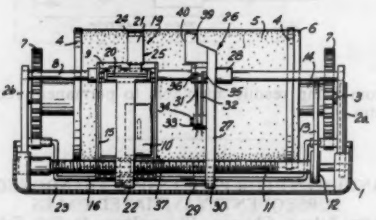
**3,586,790**

## CORRECTION SYSTEM FOR DICTATING MACHINE

Kurt Guttinger, Pfaffhausen, and Willi Nyffenegger, Oberehrendingen, both of, Switzerland, assignors to Dictaphone International AG, Wettingen (Aargau), Switzerland

Filed Dec. 20, 1968, Ser. No. 785,572
Claims priority, application Switzerland, Dec. 21, 1967, 17,954/67
Int. Cl. G11b *27/08*
U.S. Cl. 179—100.2 6 Claims



A correction system for a dictating machine having a soundhead carriage movable along the length of a cylinder which carries on its surface a magnetic recording medium of the belt or sheet type. The system includes a correction slide which can be placed in the path of the soundhead carriage as it advances along the cylinder. The correction slide has a switch adapted to be activated by the soundhead carriage which, when activated, changes the machine from its recording state to its reproducing state. This correction slide is used to prevent correct text from being mistakenly or carelessly erased or recorded over when making a correction.

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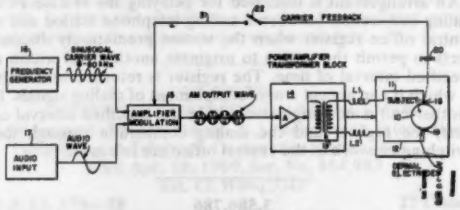
**3,586,791**

## METHOD AND APPARATUS FOR HEARING BY BIODETECTION AND BIOTRANSDUCTION OF RADIOFREQUENCY ENERGY

Henry K. Puharich, Ossining, and Joseph L. Lawrence, New York, both of, N.Y., assignors to Intelectron Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 446,267, Apr. 7, 1965, now abandoned. This application Dec. 23, 1969, Ser. No. 887,676
Int. Cl. H04r *25/00*
U.S. Cl. 179—107 7 Claims




The present invention relates to a method and apparatus utilizing R-F carriers of predetermined frequencies to stimulate the sensation of hearing in human subjects and, more particularly, to a method and apparatus for establishing a peak LC series resonant coupling, at approximately the predetermined R-F carrier frequency, between a signal source and the facial nerve system of the human subject to transmit A-F information modulated onto the R-F carrier to

the brain through the "facial nerve system," well-defined anatomical network of nerves. More particularly, the modulated R-F signal is capacitively coupled to opposite sides of the head at the periaural and/or stylomastoid region through electrodes. A series inductor is included between the source of R-F signals and each of said electrodes and the inductance of said series inductors is related to the capacitance of the coupling electrodes and the capacitance of the head of the subject so as to tune the R-F signals in peak LC series resonance substantially at the selected carrier wave frequency regardless of changes in the physiology of the subject, said means being a necessary condition for auditory information transfer to the deaf.

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**3,586,792**

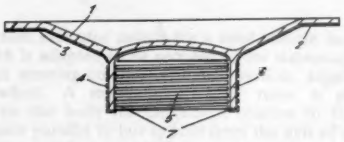
## METHOD FOR ASSEMBLING ELECTRO-ACOUSTICAL TRANSDUCER DIAPHRAGM ASSEMBLIES

**Michael Lawrence Gayford, Harlow, Essex, England, assignor to International Standard Electric Corporation**

**Continuation of application Ser. No. 568,047, July 27, 1966, now abandoned. This application Feb. 24, 1970, Ser. No. 14,723**

**Int. Cl. H04r** *9/04*

**U.S. Cl. 179—115.5VC** **4 Claims**



Diaphragm assemblies are provided for use in moving coil transducers. A diaphragm has a speech coil former extending from the rear face of the diaphragm. The complete surfaces of the diaphragm and the speech coil former are coated with a metallic layer, and sections of the layer are removed from the former to provide the speech coil.

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**3,586,793**

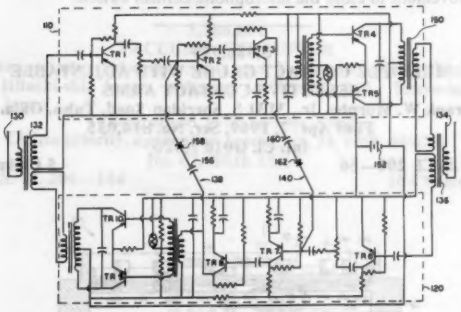
## TWO WAY REPEATER

**John C. Neal, 214 St. Christopher Lane, Columbus, Ohio 43201**

**Filed June 21, 1968, Ser. No. 739,124**

**Int. Cl. H04b** *3/20;* **H04l** *25/52*

**U.S. Cl. 179—170.2** **11 Claims**



A two-way two-wire repeater is disclosed comprising two oppositely directed amplifiers coupled to a transmission line. The repeater is provided with a series capacitor and diode connected to feed a portion of the signal at the output of a stage of one amplifier to the input of a stage of the oppositely directed amplifier. This feed-across path eliminates the need for "hybrid coil" coupling by deforming amplifier oscillation into pulses and permitting the pulses to be amplitude or height modulated.

**3,586,794**

## EARPHONE HAVING SOUND DETOUR PATH

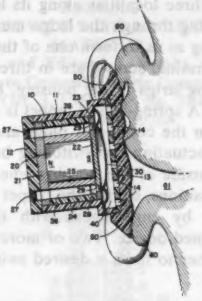
**Erhard Michaelis, Bissendorf, Germany, assignor to Sennheiser Electronic, Wennebostel, bei Bissendorf, Germany**

**Filed Nov. 1, 1968, Ser. No. 772,636**

**Claims priority, application Germany, Nov. 4, 1967, P 15 37 700.1**

**Int. Cl. H04r** *1/10*

**U.S. Cl. 179—182 R** **12 Claims**



A dynamic acoustic transducer which is worn in the vicinity of the ear, with sound outlets on both sides of the diaphragm, one of them acting directly on the auditory canal, while one or more others reach the entrance to the auditory canal only via detours is shown. The resonant frequency of the diaphragm lies in the lower transmission range. Means in the form of a spacer are provided which prevent a sealing off of the entrance to the auditory canal with respect to the air space surrounding the head and the acoustic transducer. The spacer is made of acoustically damping material and may be in the form of an acoustic foam cushion. The spacer may be provided with one or more openings on its surface between the diaphragm and the auditory canal. The sound outlet or outlets from the side of the diaphragm facing away from the ear to the air space surrounding the acoustic transducer and the head are conducted via acoustic conduits which are terminated with their characteristic impedance on the end discharging into the air space. The acoustic conduits are so dimensioned that their characteristic impedance coupled to the diaphragm damps the diaphragm.

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**3,586,795**

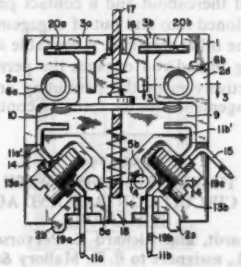
## ELECTRICAL CONNECTOR AND SWITCHING DEVICE

**Fritz Mentel, Frankfurt am Main, and Rolf A. Mais, Amberg, both of, Germany, assignors to Voigt & Haeffner G.m.b.H., Frankfurt, Germany**

**Filed Feb. 6, 1970, Ser. No. 9,150**

**Int. Cl. H01h** *15/00*

**U.S. Cl. 200—16** **8 Claims**



The housing of an electrical device has connector sockets on one side and connector plugs on the opposite side. The housing comprises a backplate and a front plate each made

of molded plastic material. The backplate has integral ledge members. The front plate, which is preferably transparent, to reveal the interior, is placed on top of the ledge members and has integrally formed tubular and full-bodied rivets which pass through the ledge members and have their ends secured in corresponding recesses on the backface of the backplate. The ledge members surround a switching chamber within the housing. A switching bridge is movable in the chamber between two switching positions and is engageable with fixed contacts depending upon the position occupied at a time. The fixed contacts comprise sheet-metal strips each having a curved shape at three localities along its length, the end of each strip extending through the ledge members to the outside of the housing so as to form one of the connector plugs of the device. Terminal screws are in threaded engagement with corresponding strips in the housing, but are accessible from the outside. A spring-biased tappet is longitudinally displaceable between the connector plugs and in parallel relation thereto for actuating the switching bridge. The tappet extends to the outside of the housing when the bridge is in one of its limit positions, so that the tappet can then be actuated directly or by engagement with the tappet of an analogously designed device. Two or more such devices can be plugged together to form a desired switching or connection arrangement.

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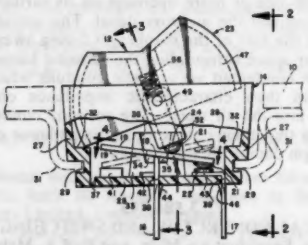
**3,586,796**

**ELECTRICAL SWITCH WITH IMPROVED COMMON TERMINAL HOUSING RETAINING MEANS FOR PIVOTED CONTACT**

**Stephen S. Simovits, Jr., Forest Park, and Christ J. Dumas, Forest View, both of, Ill., assignors to American Plasticraft Company, Chicago, Ill.**

**Filed Feb. 14, 1969, Ser. No. 799,304**
**Int. Cl. H01h** *19/00, 21/04*
**U.S. Cl. 200—6** **8 Claims**



An electrical switch including an open-ended housing having a pair of terminals mounted on the base. A permuting arm is fulcrumed intermediate its ends solely on a traversely extending end on one of the terminals. The end of the terminal projects into the housing so that the permuting arm may be pivoted thereabout and a contact point on one end thereof is positioned into and out of engagement with a contact point on the other terminal. A rockable actuating button having a spring biased rod engages the permuting arm and serves to selectively pivot the permuting arm contact into and out of engagement with the terminal contact.

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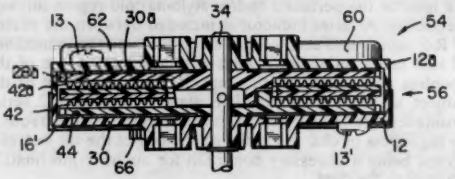
**3,586,797**

**ELECTRIC TIMER MECHANISM WITH IMPROVED PRINTED CIRCUIT CONTACT AND ACTUATING STRUCTURE**

**Peter H. Gerhardt, and Richard E. Pervorse, both of Indianapolis, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.**

**Filed Mar. 20, 1969, Ser. No. 808,807**
**Int. Cl. H01h** *7/08, 43/10*
**U.S. Cl. 200—38** **17 Claims**

A printed circuit timer which includes a housing, a shaft rotatably carried by and extending through the housing, at least one printed circuit board carried by the housing, at least one current selector means carried by the shaft, and means




driving the current selector means. The current selector means includes wiper means adapted to engage electrical circuit means of the circuit board.

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**3,586,798**

**BODY-ATTACHED SWITCH MEANS AND HOLDER FOR A MICROPHONE**

**Zane O. Holmes, 2527 N.E. 57th Ave., Portland, Oreg.**

**Filed Mar. 19, 1969, Ser. No. 808,600**
**Int. Cl. H01h** *35/00*
**U.S. Cl. 200—52** **3 Claims**

Presently disclosed is a microphone mounted on a support which is suspended from the user's neck. An on-off switch for the microphone carries a switch actuating member terminating in proximity of the user's head to permit head movement to close the microphone control switch.

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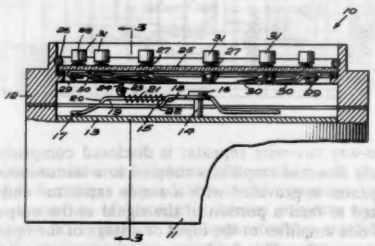
**3,586,799**

**MULTIPLE CONTACT GAUGE WITH ADJUSTABLE SELECTIVE CONTACT ARMS**

**Frank W. Murphy, Jr., 3131 S. Sheridan Road, Tulsa, Okla.**

**Filed Apr. 7, 1969, Ser. No. 814,055**
**Int. Cl. G01d** *13/26*
**U.S. Cl. 200—56** **5 Claims**



A gauge having a plurality of adjustable contacts positioned about the face with a flexible contact mounted on the

hand so that a plurality of electric circuits can be established and disestablished during the rotation of the hand about the face of the gauge.

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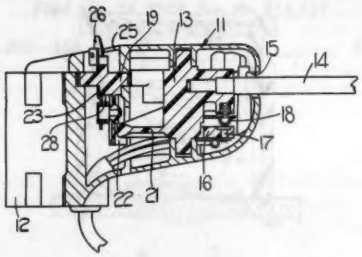
**3,586,800**
**DIRECTION INDICATOR SWITCHES**

**Alec John Heap, Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England**

**Filed Jan. 2, 1970, Ser. No. 302**
**Claims priority, application Great Britain, Jan. 13, 1969, 1877/69**
**Int. Cl. H01h** *3/16*
**U.S. Cl. 200—61.34** **1 Claim**




A direction indicator switch for a road vehicle includes a body which is adapted to be secured to the stationary, outer part of the steering column of a road vehicle, adjacent the steering wheel. A manually movable rotor is pivotally mounted on the body for movement relative to the body about an axis parallel to but spaced from the axis of rotation of the steering column, and the rotor assembly is movable between a pair of operative positions which are spaced on opposite sides of a central off position. The switch further includes contacts which are operable in the operative positions of the rotor to energize indicator lamps on opposite sides of the road vehicle respectively. A cancelling pawl assembly is operable by a striker mounted on the steering wheel, and the cancelling pawl assembly is pivotable relative to the body about an axis at right angles to the axis about which the rotor is movable. The cancelling pawl assembly has a pair of operative positions on opposite sides of a central inoperative position, and there is provided a finger on the rotor which engages between a pair of walls on the cancelling pawl assembly to couple the cancelling pawl assembly and the rotor so that movement of the rotor is transmitted to cause movement of the cancelling pawl assembly, and similarly movement of the cancelling pawl assembly is transmitted to cause movement of the rotor.

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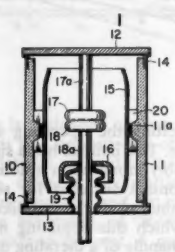
**3,586,801**
**VACUUM INTERRUPTER**

**Osamu Saito; Takamasa Saito, and Yutaka Iwashima, all of Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo-to, Japan**

**Filed Jan. 26, 1970, Ser. No. 5,850**
**Claims priority, application Japan, Jan. 24, 1969, 44/4751**
**Int. Cl. H01h** *33/66*
**U.S. Cl. 200—144** **10 Claims**




A supporting member for the tubular intermediate metallic shield of a vacuum interrupter, which comprises a first metallic strip secured to the outer surface of the shield, second and third metallic strips formed integrally with the first strip and each extending from the respective sides of the first strip at a predetermined angle, one of the side edges of each of the second and third metallic strips engaging with an inclined side of a trapezoidal projection formed along the internal surface of dielectric cylindrical casing which forms the vacuum envelope, the second and third strips being bent so that the folding lines between the main plane of the second and third strips and the main plane of the first strip are generally parallel to the axis of the tubular shield.

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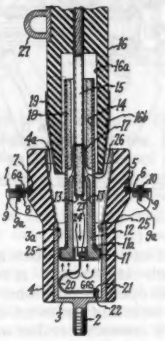
**3,586,802**
**LOAD BREAK DEVICE WITH ARC-EXTINGUISHING MATERIAL**

**Frank S. Nichols, and Edward J. Kotski, both of Pittsfield, Mass., assignors to General Electric Company**

**Filed Oct. 3, 1968, Ser. No. 764,677**
**Int. Cl. H01h** *33/60*
**U.S. Cl. 200—144** **1 Claim**




High voltage arc-interrupting load break device with gas-actuated apparatus for closing the contacts of the device incorporates gas evolving arc-extinguishing material comprising cycloaliphatic epoxy resin and hydrated alumina for producing optimum amount and rate of gas evolution.

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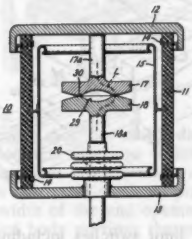
**3,586,803**
**VACUUM-TYPE CIRCUIT INTERRUPTER WITH CONTACT MATERIAL CONTAINING A MINOR PERCENTAGE OF BERYLLIUM**

**Fordyce H. Horn, deceased, late of Schenectady County, N.Y. (by Helen W. Horn, executrix, Schenectady, N.Y.); Joseph W. Porter, and Joseph L. Talento, both of Media, Pa., assignors to General Electric Company**

**Continuation-in-part of application Ser. No. 647,646, June 21, 1967, now abandoned. This application Dec. 29, 1969, Ser. No. 889,000**
**Int. Cl. H01h** *33/66*
**U.S. Cl. 200—144** **6 Claims**




A vacuum-type circuit interrupter comprising a pair of contacts relatively movable into and out of engagement, the contacts having circuit-making and -breaking regions formed

of an alloy consisting essentially of copper-beryllium and bismuth, the beryllium being present in a quantity of between 2 percent and 19 percent by weight of the copper-beryllium and the bismuth being present in a quantity of less than about 5 percent by weight of the total alloy but in a sufficient quantity to inhibit contact welding.

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**3,586,804**

**DISCONNECT SWITCH**

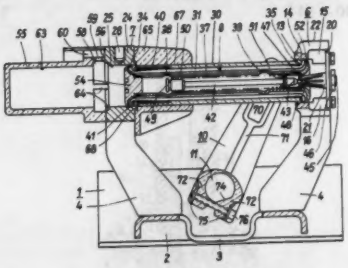
**Heinz-Helmut Schramm; Claus Kessler; Paul Kuenzle, and Hans-Karl Reuter, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany**

**Filed Dec. 3, 1968, Ser. No. 780,731**

**Claims priority, application Germany, Dec. 12, 1967, Feb. 16, 1968, P 16 90 113.6; P 16 90 143.2**

**Int. Cl. H01h** *33/82*

**U.S. Cl. 200—146** **36 Claims**



A load-disconnect switch comprises an elongated switch-pin structure which is linearly movable longitudinally between closing and opening positions. In the closing position the switch-pin structure forms an electrical connection between a stationary contact member and a stationary slide contact. For interrupting the current the switch has a load switching assembly which comprises the stationary slide contact and the correlated end of the switch-pin structure, as well as two insulating tubes of which one is movable and surrounds the switch-pin structure, whereas the other tube is stationarily connected with the slide contact and surrounds the movable tube. The movable tube is coaxially and fixedly joined with the movable switch-pin structure. Auxiliary contact means temporarily connect the switch-pin structure with the stationary contact member during the initial part of the switch-pin travel toward the open position.

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**3,586,805**

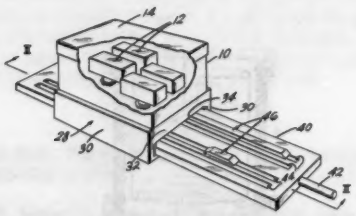
**MULTIPLE CAM LIMIT SWITCH ACTUATOR**

**Clarence B. Ziegler, Jr., 3510 Balmars Court, Jackson, Mich.**

**Continuation-in-part of application Ser. No. 674,595, Oct. 11, 1967, now Patent No. 3,472,977. This application Apr. 21, 1969, Ser. No. 817,838**

**Int. Cl. H01h** *43/06*

**U.S. Cl. 200—153** **5 Claims**



An actuator for limit switches including a relatively flat cam slide plate upon which a plurality of cams are mounted for adjustment within tracks, the cam slide plate being slidably disposed relative to a plurality of switches, a switch being aligned with each cam track wherein the cams may be selectively positioned within the associated track to provide a desired sequence of switch operation upon movement of the cam slide.

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**3,586,806**

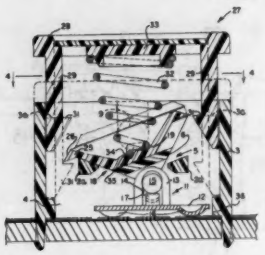
**BISTABLE RECIPROCABLE SWITCH CONSTRUCTION**

**William F. Swisher, St. Clair Shores, Mich., assignor to Essex International, Inc., Fort Wayne, Ind.**

**Filed May 2, 1969, Ser. No. 821,292**

**Int. Cl. H01h** *3/12*

**U.S. Cl. 200—153 J** **19 Claims**



A reciprocable switch comprises a contact carrier movable to either of two operating positions in response to a cycle of operation of a pushbutton and in which the carrier is stable in either of its two positions. The carrier is coupled to a oscillatory actuator which is rockable between two extreme positions. The actuator supports an index slide which is straddled by indexing barbs carried by the pushbutton, engagement of the slide by one barb effecting rocking of the actuator from one position to the other. A spring urges the pushbutton to a normal position, maintains the carrier and the actuator in stable positions, and effects shifting of the slide from a position in which it is engageable by one of the indexing barbs to a position in which it is engageable by another of the indexing barbs. The parts of the switch are contained in a casing which removably may be fitted to a support on which the fixed contacts are mounted.

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**3,586,807**

**DICTATING MACHINE BALL-LIKE FINGER CONTROL MOUNTED BY A UNIVERSAL JOINT**

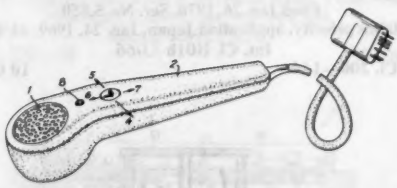
**Kurt Guttinger, Pfaffhausen, Switzerland, assignor to Dictaphone International A.G., Wettingen (Aargau), Switzerland**

**Filed Jan. 23, 1969, Ser. No. 793,421**

**Claims priority, application Switzerland, Jan. 24, 1968, 1067/68**

**Int. Cl. H01h** *25/04, 21/10, 9/06*

**U.S. Cl. 200—157** **8 Claims**



A control for setting the operating states of a dictating machine or the like. This control has a single ball-like actuating member rotatably mounted in a housing and operatively associated with contact switches for setting the operating states of the machine when the ball-like control is rotated. The housing, in which this actuating member is mounted, which may be the handle of a dictating machine microphone, preferably is adapted to be held by hand. The ball-like actuating member is then positioned on the housing so that it will be conveniently near a finger, preferably a thumb, when

the housing is held. A universal joint is secured to said actuating member and pivotally mounted along a pair of axes intersecting at right angles to each other, thereby permitting movement of said actuating member perpendicularly in a second direction of movement from either end of a first direction of movement. With only a small amount of movement, the ball-like control is easily rotated by a finger for setting all of the operating states of the machine.

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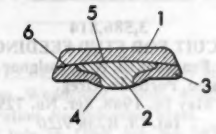
3,586,808

## BUTTON TYPE COMPOSITE CONTACT

Akira Shibata, and Shigeru Tabei, both of Tokyo, Japan, assignors to Chugai Electric Industrial Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1969, Ser. No. 815,547
Int. Cl. H01h 1/02
U.S. Cl. 200—166 5 Claims




A button-type composite contact having a contact surface element of precious metal bonded to a composite base metal backup element. The composite backup element is formed of a first base metal portion in integral relation with a second base metal portion. An end face of the integral first and second base metal portions is intimately pressure bonded to the precious metal contact element via one of said base metals which is pressure bondable to the precious metal. The other of said base metals is spot weldable at the free end of said composite backup element, such that the button-type contact element can be spot welded via the free end of said backup element to another metallic element.

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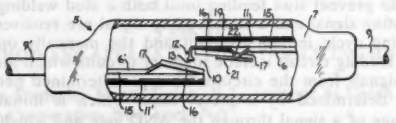
3,586,809

## REED SWITCH FOR RAPID CYCLE, HIGH POWER APPLICATIONS

John D. Santi, West Allis, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Continuation of application Ser. No. 714,490, Mar. 20, 1968, now abandoned. This application Apr. 24, 1969, Ser. No. 818,913
Int. Cl. H01h 1/04
U.S. Cl. 200—166 25 Claims



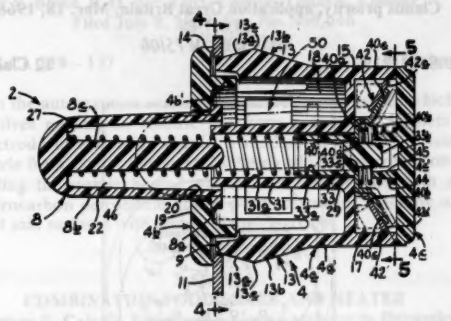
Each of the reeds is preloaded against a thicker post that extends along it at its side opposite the other reed. Each has an anchor portion flatwise secured to the post, a flat armature portion, and a thinner neck portion connecting the anchor and armature portions and extending obliquely to them. The reeds are bimetallic, of "Kovar" and "Niromet 42," with the latter next to the post. A molybdenum contactor carried by one reed cooperates with a tungsten contact on the other. Operating parts are hermetically sealed in an envelope evacuated to a deep vacuum.

3,586,810

## WATERPROOF PLUNGER ACTUATED SWITCH ASSEMBLY

William L. Brown, Lake Zurich, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.

Filed Feb. 9, 1970, Ser. No. 9,607
Int. Cl. H01h 9/04
U.S. Cl. 200—168G 10 Claims



A plunger actuated switch assembly comprising a housing with a plunger-receiving space at the front thereof and a switch compartment at the rear thereof sealed from the rest of the housing except for a switch actuator-receiving opening at the front thereof. An imperforate open-ended sleeve extends forwardly from the opening and a switch actuator member is mounted in a passageway within the sleeve. A plunger member is provided extending through an opening at the front of the housing, the plunger member having a sleeve-receiving cavity open at the rear and defined by a longitudinally extending skirt movable around the sleeve. A first compression spring extends between the plunger member and the switch actuator member and a second weaker spring urges a switch contactor member in the switch compartment against the switch actuator member.

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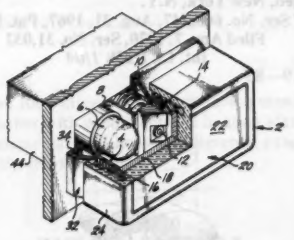
3,586,811

## MOISTURE SEAL FOR PUSHBUTTON CAPPED ELECTRICAL CARTRIDGES WHICH ARE CLAMPED TO A PANEL

James W. Amis, Jr., Bellevue; Maurice D. Fuller, Mercer Island, and James B. Dobson, Seattle, all of, Wash., assignors to Korry Manufacturing Company, Seattle, Wash.

Filed May 22, 1969, Ser. No. 826,963
Int. Cl. H01h 9/04
U.S. Cl. 200—168 5 Claims



A resiliently flexible moisture seal is disclosed for a push-button capped electrical cartridge which is clamped to a panel. The seal comprises an elastomeric sleeve which has an inside diameter in one cross-sectional plane thereof that is greater than the width of the end opening in the cartridge; and axially inclined body portions thereof on the opposite sides of the plane, one of which is clamped onto the panel with the cartridge, about the open end thereof, and the other of which enables the seal to flex with respect to the panel, when the cap is peripherally engaged with the seal and

reciprocably inserted in the cartridge, through the opening in the sleeve.

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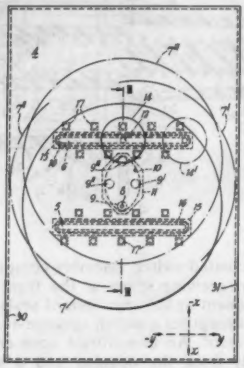
**3,586,812**

**MAINTENANCE OF A WORKPIECE AT A PRESSURE OTHER THAN AMBIENT ATMOSPHERIC PRESSURE**

**Leonard Fisher, Hampshire, England, assignor to Vickers Limited, London, England**

**Filed Mar. 13, 1969, Ser. No. 806,962**
**Claims priority, application Great Britain, Mar. 18, 1968, 13,077/68**
**Int. Cl. B23k** *15/00*
**U.S. Cl. 219—72** **12 Claims**



One wall of an enclosure unit that bounds a working chamber in the unit is formed with a slot which is sealed over in slidable manner by a cover plate. The cover plate has an aperture which can be moved along the slot, and a tool (for example a charged-particle gun) can be attached to the cover plate in gastight manner to operate, via the aperture and the slot, upon a workpiece in the chamber. The cover plate is mounted to rotate parallel to the said one wall, and to undergo translational movement transversely with respect to the slot, as the aperture is moved along the slot. Guide means operate on the cover plate to limit its translational movement so that it cannot project beyond two opposite sides of the unit.

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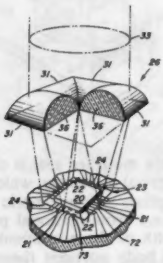
**3,586,813**

**SIMULTANEOUS MULTIPLE LEAD BONDING**

**David Graham Cruickshank, Pennington, N.J.; James Philbert Epperson, Winston Salem, N.C.; William Alexander Murray, Sr., Trenton, and Richard Allen Wydro, Sr., Trenton, N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.**

**Division of Ser. No. 666,747, Aug. 31, 1967, Pat. No. 3,534,460.**
**Filed Apr. 7, 1970, Ser. No. 31,032**
**Int. Cl. B23k** *1/04*
**U.S. Cl. 219—85** **2 Claims**



The bonding of multiple leads on an individual basis is a tedious, time-consuming operation which is often impractical and uneconomical. For example, in bonding individual leads with a beam of radiant energy such as a laser beam, it is frequently impractical and uneconomical to align the lead with a bonding site, align the bonding site and the lead with the beam of radiant energy, apply the laser beam and then repeat the process for each lead to be bonded. As disclosed herein, a beam of radiant energy is shaped into a predetermined pattern so that the beam can be simultaneously applied to a plurality of leads. A composite cylindrical lens is disclosed, for example, which includes a plurality of cylindrical lens segments wherein a line formed by each segment when a collimated beam of radiant energy strikes the composite lens forms a side of a polygon. A perimeter pattern may be formed in this manner which is suitable for simultaneous multiple lead bonding. For example, in simultaneously bonding a plurality of leads extending from a beam leadlike device, the perimeter pattern may have essentially the same configuration as the device so that radiant energy may be applied simultaneously to the leads to be bonded without applying the radiant energy directly to the device itself.

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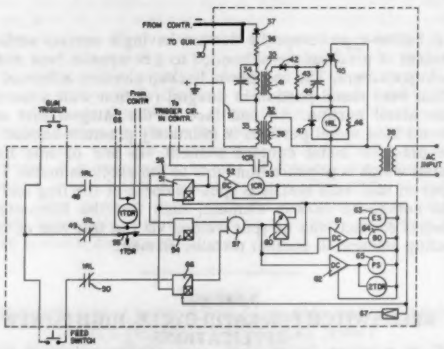
**3,586,814**

**CONTROL CIRCUIT FOR STUD FEEDING MECHANISM**

**Charles C. Pease, Pennsauken, N.J., assignor to Omark Industries, Incorporated, Portland, Oreg.**

**Filed May 16, 1968, Ser. No. 729,794**
**Int. Cl. B23k** *9/20*
**U.S. Cl. 219—98** **16 Claims**



Coordinator for coordinating the operation of a stud welding controller, a stud welding gun and mechanism for automatically feeding studs to a welding gun including circuit means for overriding the welding cycle initiating signal whenever the welding gun is not in the welding position and for completing a circuit for initiating automatic stud feeding whenever the welding gun is in other than its welding position. A manually operable stud feeding circuit is included. An AND gate is employed in the automatic stud feeding circuit to prevent stud feeding until both a stud welding cycle initiating signal and a stud feeding signal are received. The welding cycle initiating circuit and the manually operable stud feeding circuit include memory circuits which maintain the signals from the circuits for a predetermined period of time determined by a preset timer which is initiated by passage of a signal through the AND gate and which resets the memory circuits upon timing out.

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**3,586,815**

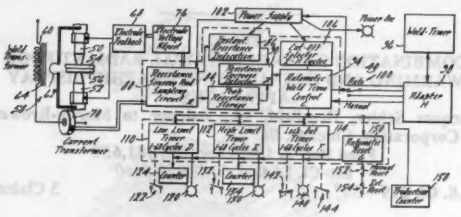
**WELDING CONTROL MECHANISM**

**Jacobus Van Eijnsbergen, and George O'Neal, Jr., both of Bloomfield Hills, Mich., assignors to Weltronic Company, Southfield, Mich.**

**Filed Mar. 26, 1969, Ser. No. 810,499**
**Int. Cl. B23k** *9/10*
**U.S. Cl. 219—110** **22 Claims**

A control circuit which is particularly adapted to be utilized in conjunction with a welding circuit wherein the voltage

across the welding electrodes and the current through the work is sensed for a variable period of time which is related to the magnitude of the current. These signals are then utilized to derive the resistance of the load or the work being welded, the system being capable of automatically terminating the weld when a preselected degree of resistance drop at the weld is sensed by the feedback control circuit.



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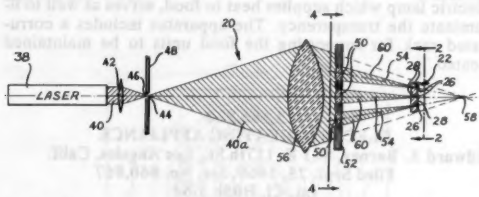
**3,586,816**

## SPOT WELDING SYSTEM AND METHOD

**Wilhelm F. Hagen, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.**

**Filed July 25, 1968, Ser. No. 747,562**
**Int. Cl. B23k 27/00**
**U.S. Cl. 219—121** **7 Claims**




A system and method for microscopic spot welding with laser radiation. The invention, having particular relationship to microscopic multiple spot welding, employs mode selection of laser emitted radiation. A number of objective lenses are positioned in a diverging mode selected laser beam and the lenses are arranged within the spread of the beam in relative geometrical positions corresponding to the number and positions of spots requiring welding. Auxiliary lens means may be employed to direct the diverging laser beam toward the object to obtain proper spacing of the welding spots. The system produces a multiplicity of microscopic welding spots on the object each of a minimum size governed by the size of the Airy disc produced by its respective objective lens.

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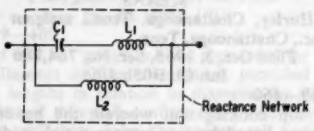
**3,586,817**

## METHOD AND APPARATUS FOR STABILIZING AN AC ARC

**August Frederick Manz, Union, N.J., assignor to Union Carbide Corporation, New York, N.Y.**

**Filed Jan. 9, 1970, Ser. No. 1,730**
**Int. Cl. B23k 9/10**
**U.S. Cl. 219—131** **10 Claims**




An inductor and capacitor first electrical equivalent circuit is connected in series circuit relationship with an AC source of potential and the electrode and workpiece for establishing a supplementary restriking potential to maintain a self-supporting AC arc while a second electrical equivalent circuit is connected in parallel with the first equivalent circuit to permit DC current to flow through the arc circuit.

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**3,586,818**

## SPATTER PROTECTING NOZZLE COATING

**Paul V. Blake, P. O. Box 4305, London, Ontario, Canada**

**Filed July 8, 1969, Ser. No. 840,046**
**Int. Cl. B23k 9/00**
**U.S. Cl. 219—137** **6 Claims**

In the automatic or semiautomatic welding of metals which involves passing an electric arc from a consumable metal electrode in a welding nozzle, a method of protecting said nozzle from spatter during said welding which comprises contacting the nozzle heated to elevated temperature with a hydrocarbon petrolatum grease prior to welding whereby to coat said surfaces with said petrolatum grease.

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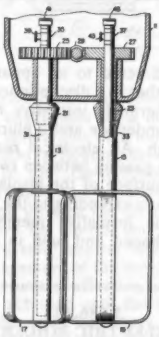
**3,586,819**

## COMBINATION FOOD MIXER AND HEATER

**Carmen P. Cairelli, Farmington, Conn., assignor to Dynamics Corporation of America, New York, N.Y.**

**Filed Apr. 4, 1969, Ser. No. 813,683**
**Int. Cl. H05b 1/00**
**U.S. Cl. 219—201** **4 Claims**



A combined food mixer and heater having standard beater elements together with solid electrical heating elements, both the beater elements and heating elements extending outwardly from the housing unit.

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**3,586,820**

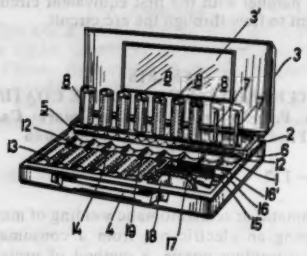
## HAIR CURLER HEATER

**Kiyoshi Yamanaka, Moriguchi-shi, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan**

**Filed July 1, 1969, Ser. No. 838,169**
**Claims priority, application Japan, Sept. 28, 1968, Sept. 28, 1968, 43/70576;43/84336**
**Int. Cl. H45d 4/12; H05b 1/00**
**U.S. Cl. 219—222** **8 Claims**

A hair curler including a case with a lid in which a heater board is provided having a number of heater rods on which the curlers are placed. With the lid of the case closed, the rods and curlers thereon lie in a generally horizontal position.

When the lid is open, the heater board is moved raising the heater rods and curlers to a generally vertical position for use. Opening of the lid also actuates a switching means to supply current to the heater board.



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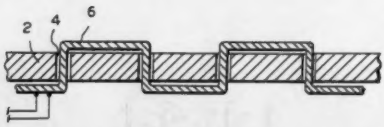
**3,586,821**

**APPARATUS FOR PRODUCING SEALS ACCORDING TO THE MULTIPOINT METHOD**

**Robert Konrad Buob, Como, Italy, assignor to W. R. Grace & Co., Duncan, S.C.**

**Filed Jan. 26, 1966, Ser. No. 523,203**
**Claims priority, application Germany, Feb. 10, 1965, D46481**
**Int. Cl. H05b** *1/00*
**U.S. Cl. 219—243** **1 Claim**



This invention is directed to an apparatus for thermally sealing materials together in a discontinuous manner. The apparatus includes a thermally insulative member that has a sealing surface, and underside and a plurality of spaced perforations therethrough. An electrical resistance wire has a plurality of first parts passing between two adjacent perforations on the sealing surface of the insulative member and a plurality of second parts extending to the next perforation on the underside of the insulative member. The insulative member is convex shaped and held in convex position by means of springs.

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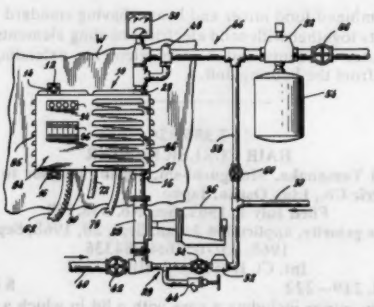
**3,586,822**

**ELECTRIC BOILER**

**Michael W. Pastore, West Simsbury, Conn., assignor to Argo Industries, Incorporated, Berlin, Conn.**

**Filed Jan. 15, 1968, Ser. No. 697,859**
**Int. Cl. F24h** *1/10*
**U.S. Cl. 219—306** **9 Claims**



A prewired, unit-handled electric water boiler having a boiler casting housing a plurality of immersible heater elements, a removable control panel on which all the circuit elements are mounted including sequentially activable heater control relays and individual pilot lights for indicating energization of each heater element.

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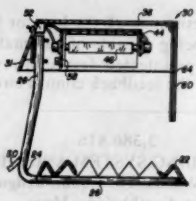
**3,586,823**

**COMBINATION OF AN ELECTRICAL RADIANT FOOD WARMING AND ILLUMINATING GRAPHIC DISPLAY APPARATUS**

**Jacques Schier, Deerfield, Ill., assignor to Martin-Brower Corporation, Chicago, Ill.**

**Filed Dec. 3, 1969, Ser. No. 881,659**
**Int. Cl. F24h** *9/02*; **H05b** *3/40*
**U.S. Cl. 219—347** **3 Claims**



An apparatus for maintaining food at an elevated temperature and for simultaneously illuminating a graphic transparency containing decorative or advertising material. An electric lamp which supplies heat to food, serves as well to illuminate the transparency. The apparatus includes a corrugated rack for supporting the food units to be maintained heated.

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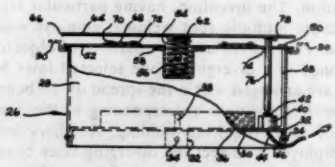
**3,586,824**

**ELECTRIC HEATING APPLIANCE**

**Edward A. Barney, 841 E. 117th St., Los Angeles, Calif.**

**Filed Sept. 25, 1969, Ser. No. 860,867**
**Int. Cl. H05b** *3/68*
**U.S. Cl. 219—452** **5 Claims**



An electric heating appliance in which a plate adapted to support a food bearing article is disposed over a heating element so as to move downwardly toward the element when the article is placed thereon, and moves upwardly away from the element when the article is removed. Switching means are provided whereby the heating element is energized upon downward movement of the plate and deenergized upon upward movement of the plate.

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**3,586,825**

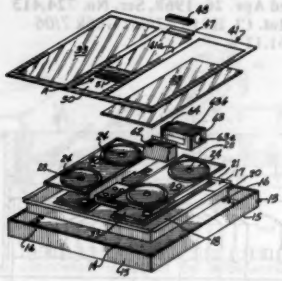
**FLUSH TOP COOKING UNIT WITH VENTILATING MEANS**

**James E. Hurley, Chattanooga, Tenn., assignor to Modern Maid, Inc., Chattanooga, Tenn.**

**Filed Oct. 3, 1968, Ser. No. 764,780**
**Int. Cl. H05b** *3/68*
**U.S. Cl. 219—460** **10 Claims**

A flush top cooking unit wherein the heating element therefor has a broad heating surface which is disposed adjacent to but spaced from the underside of an exposed imperforate thermal conductive plate. Encircling the perimeter of the heating surface and in sealing engagement with the plate

underside is an upright thermal shield. The plate underside and the thermal shield cooperate with the heating surface to



form a broad but shallow passageway through which air circulates and scrubs the plate underside.

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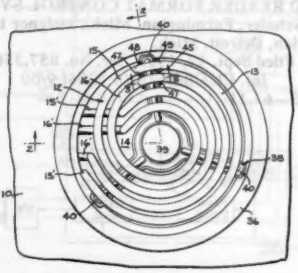
**3,586,826**
**SURFACE HEATING UNIT WITH A REMOVABLE SUPPORT**
**Raymond L. Dills, Louisville, Ky., assignor to General Electric Company**
**Filed Sept. 11, 1969, Ser. No. 857,060**
**Int. Cl. H05b** *3/68*
**U.S. Cl. 219—463** **2 Claims**



A surface heating unit for use with an electric range or the like having a metal sheathed resistance heating element coiled into a flat spiral. The heating element is supported in a flat plane by a spider underlying the element. The spider has a hub with a plurality of radial arms. Encircling the heating element is a removable trim ring that is supported in an opening in a cooktop and it functions to engage the extremities of the spider to support the same. A U-shaped clip member is staked to the underside of the turns of the element. One radial arm of the spider is forced fit into the clip and becomes integral therewith.

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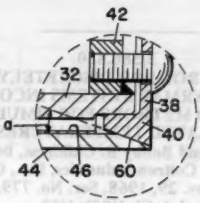
**3,586,827**
**HEATED ROLL ASSEMBLY**
**Charles S. W. King, Charlotte, N.C., assignor to R. H. Bouligny, Inc., Charlotte, N.C.**
**Filed Jan. 7, 1970, Ser. No. 1,182**
**Int. Cl. H05b** *1/02*
**U.S. Cl. 219—469** **5 Claims**

A heated roll or "godet" of the type used for processing synthetic filament or film elements is provided in greater than usual lengths in relation to diameter by employing a shell member of thin-wall configuration with heating means at its inner surface to form the heated roll periphery, and supporting this shell member at both ends while mounting it for rotation on a stub shaft with one shell member end interfitted with a support member on a taper having a slope angle whose tangent corresponds to the ratio of the change of shell member radius to change in length in response to temperature change, so that the shell member remains free for



diametric and longitudinal expansion under the influence of the heating means while being firmly assembled for operation.

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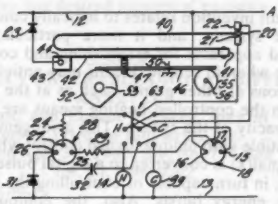
**3,586,828**
**THERMOSTAT CONTROL MEANS**
**Donald J. Bohn, 1501 N. Miracle Mile, Tucson, Ariz.**
**Filed June 18, 1969, Ser. No. 834,344**
**Int. Cl. H05b** *1/02*
**U.S. Cl. 219—429** **9 Claims**



A thermostat control means is constructed with a pair of stationary contacts engageable by a movable contact upon oppositely directed deflections of a bimetal. A continuously operated cam operates a floating drive member to bodily move the bimetal so that the movable contact cyclically moves toward and away from the stationary contacts. An adjusting cam operating through the drive members is also effective to bodily move the bimetal and movable contact carried thereby. A solid state control circuit is so constructed that momentary engagement of the movable contact with one of the stationary contacts is effective to actuate a relay and maintain such relay actuated until the movable contact momentarily engages the other stationary contact, after which the relay is deactuated and remains deactuated until subsequent momentary engagement of the movable contact with the first of the stationary contacts.

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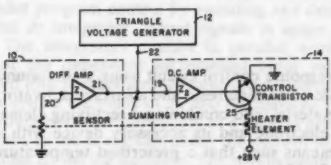
**3,586,829**
**ON-OFF HEATER CONTROL**
**Carl E. Farmer, Laurel, and Robert Noel Longuemare, Jr., Ellicott City, both of, Md., assignors to The United States of America as represented by the Secretary of the Navy**
**Filed Dec. 29, 1969, Ser. No. 888,578**
**Int. Cl. H05b** *1/02*
**U.S. Cl. 219—497** **2 Claims**




An On-Off heater control consisting of a switching-type, proportional, temperature regulating control circuit compris-

ing a temperature sensing bridge and differential amplifier which has an output voltage which is a function of input temperature, a triangular voltage function generator, and a comparator and saturating DC amplifier for driving the heating elements.

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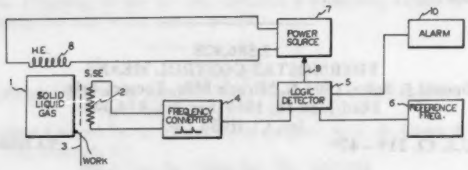
**3,586,830**

## LOGICAL CONTROL FOR DISCRETELY METERING ENERGY TO THERMAL SYSTEMS INCORPORATING APPARATUS AND METHODS FOR SIMULATING TIME RELATED TEMPERATURES

**Frank W. Leitner, and Bobby B. Childress, both of Charlotte, N.C., assignors to Coltron Industries, Inc., Charlotte, N.C.**

**Filed Nov. 29, 1968, Ser. No. 779,778**
**Int. Cl. H05b *1/02***
**U.S. Cl. 219—501** **27 Claims**




The present invention relates to logically controlled unique temperature systems, and it more particularly relates to methods and apparatus for establishing and controlling thermal systems wherein sensing means may anticipate temperature conditions at other points, such as at the work or loads and wherein the controlled heating means are related to the thermal capacity of the system. This arrangement is particularly compatible with unique logical control wherein the temperature signal(s) is converted to a digital pulse train for logical analysis, in turn capable of controlling the heating means by discrete energy bursts. Also, the computer or logical means are capable of sounding an alarm in the event of abnormal conditions or conditions deviating from predetermined patterns.

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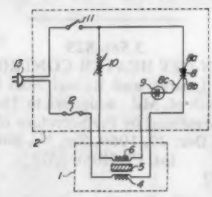
**3,586,831**

## HEAT RESPONSE CONTROL CIRCUIT

**Akisada Naoi, Tokyo, and Masaaki Kubo, Funabashi-shi, Japan, assignors to Hitachi Heating Appliances Co., Ltd., Tokyo, Japan**

**Filed Dec. 30, 1969, Ser. No. 889,029**
**Claims priority, application Japan, Mar. 7, 1969, 44/16893**
**Int. Cl. H05b *1/02***
**U.S. Cl. 219—505** **1 Claim**



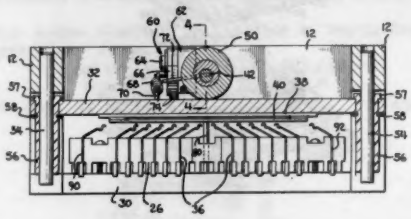
A heat response control circuit using a compound of a low hygroscopic polyamide resin and a surface activator as a heat sensitive material, and combining a rectifying element having a control electrode and its accessory device with said heat-sensitive means such that a prescribed temperature may be maintained within a usual temperature range; heating is automatically discontinued in the case of accidental overheating, but is automatically reset when cooled down to within the usual temperature range.

**3,586,832**

## CARD READER

**Bryce Wilson Blair, Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Apr. 26, 1968, Ser. No. 724,413**
**Int. Cl. H01h *43/08*; G06k *7/06***
**U.S. Cl. 235—61.11 A** **7 Claims**



In a card reader of the type having contact springs which read through the holes in a card, an improved arrangement of the springs. The springs are grouped in two opposing banks so that as they are deflected against a platen in reading a card, the sidewise forces exerted by the springs are cancelled out leaving only a thrust perpendicular to the platen. This simplifies the mounting and guiding of the platen toward and away from the springs. Another aspect of the invention lies in an improved frame and guide arrangement in which the springs and platen are mounted.

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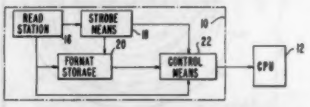
**3,586,833**

## CARD READER FORMAT CONTROL SYSTEM

**Robert H. Schafer, Farmington, Mich., assignor to Burroughs Corporation, Detroit, Mich.**

**Filed Sept. 12, 1969, Ser. No. 857,356**
**Int. Cl. G06k *7/016*; G06f *9/00***
**U.S. Cl. 235—61.11** **3 Claims**




A format control system for card readers having a multiple stage shift register for storing formatting information. Each stage of the shift register corresponds to a column of information on a data punched card. A special combination of information markings in the first column of a format card permits a new format information to be read by the card reader and stored in the shift register. As punched cards are being read, a strobe member synchronizes the corresponding stage of the format shift register with the card column being read to control the data flow from the card reader to a central processor.

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**3,586,834**

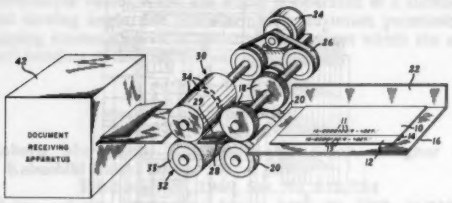
## EMBOSSED CORRECTION SLIP BEARING DOCUMENT, AND APPARATUS AND METHOD FOR ADAPTING A DOCUMENT AND ATTACHED CORRECTION SLIP FOR DOCUMENT HANDLING WITH A PLURALITY OF OTHER DOCUMENTS

**David E. Dykaar, Great Neck, and Bernard J. Stein, Jamaica Estates, both of, N.Y., assignors to Lundy Electronics & Systems Inc., Glen Head, N.Y.**

**Filed Oct. 21, 1969, Ser. No. 868,004**
**Int. Cl. G06k *19/04***
**U.S. Cl. 235—61.12** **19 Claims**

A system for adapting an indicia bearing document having an indicia bearing correction slip secured thereto for document handling in stacked relation with other documents, the thickness of the document being increased at a particular zone due to the attachment of the correction slip. The docu-

ment is guided to an embosser, which embosses a portion of the document at a location spaced from the increased thickness zone so as to increase the thickness of the document at the embossed location by substantially the same amount as the document thickness is increased at the increased thickness zone.

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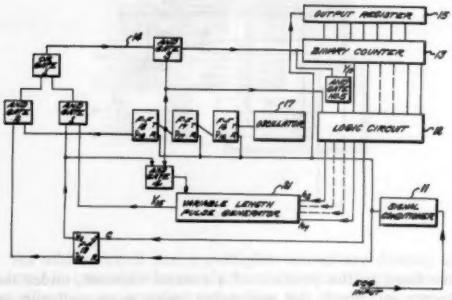
**3,586,835**

## DIGITAL CARDIOTACHOMETER

**Adolph W. Foeh, Jr., San Antonio, Tex., assignor to The United States of America as represented by the Secretary of the Air Force**

**Filed Apr. 19, 1968, Ser. No. 722,743**
**Int. Cl. G06m** *1/38*
**U.S. Cl. 235—92** **3 Claims**




A digital cardiotachometer having a down counter with a hyperbolic rate that is started and terminated by successive heartbeats and the heartbeat is read out of a register. The counter output is also fed into a logic circuit which inhibits pulses in the counter in a feedback loop to obtain the hyperbolic counter rate. The highest expected heart rate is initially reset into the counter which starts its hyperbolic countdown after a delay that is controlled by the counter itself. The logic circuit generates a pulse which switches the input to the counter through a gating circuit, from linear to hyperbolic input pulses.

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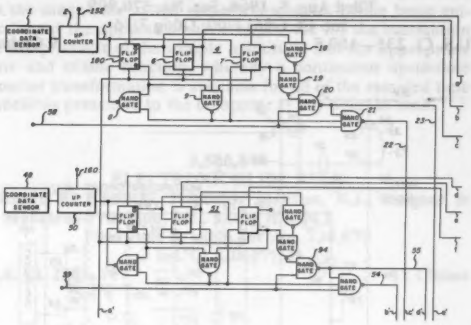
**3,586,836**

## TIME-SHARED BIDIRECTIONAL PULSE COUNTER

**John J. Paul, Montreal, Quebec, Canada, assignor to Sperry Rand Canada Limited, Toronto, Ontario, Canada**

**Filed Oct. 17, 1968, Ser. No. 768,486**
**Claims priority, application Canada, Aug. 29, 1968, 28,841**
**Int. Cl. G06g** *7/00;* **H03k** *21/00, 23/08*
**U.S. Cl. 235—92** **8 Claims**

Apparatus for counting the number of pulses in recurring groups of pulses and for accumulating positive and negative increments in the number of pulses in each group in excess of a predetermined amount. The pulse groups are applied to an UP (forward) counter which overflows into a preset DOWN (backward) counter to provide a signal for incrementing a bidirectional counter. The number appearing in the bidirectional counter after a preceding pulse group is preset into the DOWN counter between groups. The number remaining in the DOWN counter after the next succeeding pulse group determines the sense and magnitude of the increment to be applied to the bidirectional counter. A second bidirectional counter cascaded to the first bidirectional counter provides any desired numerical capacity.

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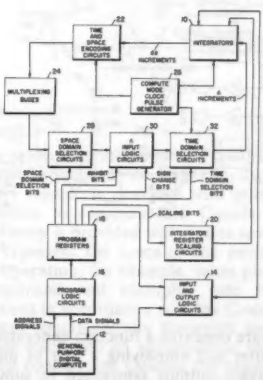
**3,586,837**

## ELECTRICALLY ALTERABLE DIGITAL DIFFERENTIAL ANALYZER

**Gilbert P. Hyatt, and Eugene Ohlberg, both of Northridge, Calif., assignors to Teledyne Industries, Inc.**

**Filed Apr. 30, 1968, Ser. No. 725,468**
**Int. Cl. G06j** *1/02*
**U.S. Cl. 235—150.31** **25 Claims**



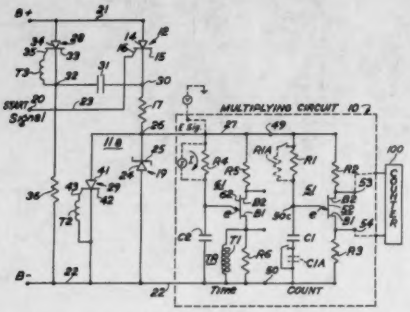

An arrangement is provided in which the inputs and outputs of digital differential analyzer integrators are interconnected under program control by encoding and decoding the incremental *dz* integrator output signals in space and time domains. The integrators operate in parallel word fashion, the sum of the dependent incremental input variables *dy* being added to a parallel arrangement of full adders in the Y register to update the value of Y, and the updated value of Y being transferred via the full adders to a parallel arrangement of full adders in the R register under the control of independent variables *dx* during iteration. The independent *dx* variables are stored and employed to transfer weighted portions of the dependent incremental input variable sums into the R register during subsequent iterations to provide higher order correction of the Y values.

**3,586,838**

## ARITHMETIC CIRCUIT INCLUDING ELECTRONIC MULTIPLYING AND DIVIDING CIRCUITRY

**Robert M. Henderson, Williams Bay, and Richard Zechlin, Beloit, both of, Wis., assignors to Fairbanks Morse Inc., New York, N.Y.**

**Filed Aug. 8, 1966, Ser. No. 570,909**
**Int. Cl. G06j 1/00; G06g 7/16**
**U.S. Cl. 235—150.5** **9 Claims**




Electronic circuitry is disclosed for combining signals representative of input factors to provide arithmetic combinations thereof.

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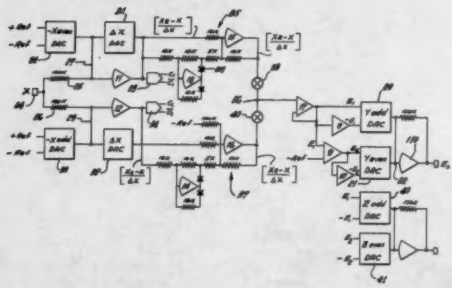
**3,586,839**

## INTERPOLATIVE FUNCTION GENERATOR HAVING A PAIR OF DIGITAL-TO-ANALOG CONVERTERS CONNECTED IN SUMMING RELATION

**Gilbert R. Grado, 17611 Orange Tree Lane, Tustin, Calif.**

**Filed Apr. 25, 1969, Ser. No. 819,181**
**Int. Cl. G06j 7/20, 1/00**
**U.S. Cl. 235—150.53** **8 Claims**



The disclosure concerns a function generator as used in an analog computer and employing a pair of digital to analog converters having outputs connected in summing relation; and circuit means connected with the converters to drive the output of one converter back and forth between function and reference values, and further characterized in that the output of one converter increases while the output of the other converter decreases, and vice versa.

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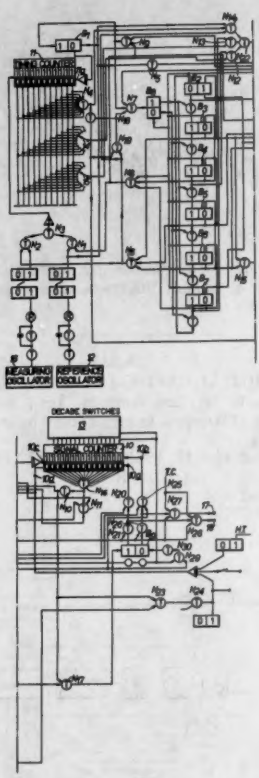
**3,586,840**

## PROCESS CONTROL APPARATUS

**John Henry Stuart Craig, Hitchin, England, assignor to Serck R. & D. Limited, Birmingham, England**

**Filed May 10, 1968, Ser. No. 728,171**
**Claims priority, application Great Britain, May 16, 1967, 22666/67**
**Int. Cl. G05b 19/02, 1/01**
**U.S. Cl. 235—151.1** **4 Claims**

A process control apparatus is provided in which an error signal and a rate of change signal are generated in respective subcycles of the cycle of operation of the apparatus. These signals are generated as residual count states in a counter.




Corrections to the position of a control element, under the influence of which the parameter being measured can be changed, are made independently at the end of the error signal generating subcycle and the end of rate-of-change signal generating subcycle.

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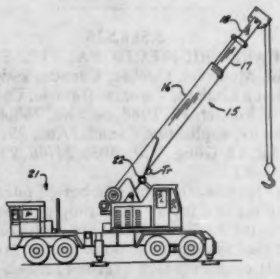
**3,586,841**

## BOOM LOAD INDICATING SYSTEM

**Robert F. Griffin, South Euclid, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio**

**Filed Feb. 14, 1969, Ser. No. 799,379**
**Int. Cl. G06g 7/12**
**U.S. Cl. 235—151.33** **27 Claims**



A boom load indicating system for a self-supporting boom which determines the maximum bending stress on the boom

and, in the case of a telescoping boom, determines the bending stress on each section of the boom. A strain transducer is mounted on the boom as close as possible to the pivot where the boom lift force is applied. Electrical analog circuitry indicates when bending stress is approaching or at a maximum permissible value. When the boom is operated at a substantial slewing angle, the predetermined maximum permissible tipping moment provides the standard against which the actual bending stress on the boom is compared.

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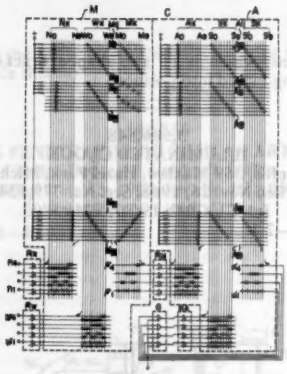
**3,586,842**
**ARITHMETIC CIRCUIT**

**Noboru Murayama, Sagamihara-shi, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan**

**Filed Mar. 26, 1969, Ser. No. 810,754**
**Claims priority, application Japan, Mar. 29, 1968, 43/20073**
**Int. Cl. G06f *11/10*; G08b *29/00***
**U.S. Cl. 235—153** **4 Claims**



An adder circuit and a multiplier circuit are directly connected in cascade into an electronic arithmetic circuit which is utilized in generating or checking the check digit attached to the important codes of the input data to the electronic computer.

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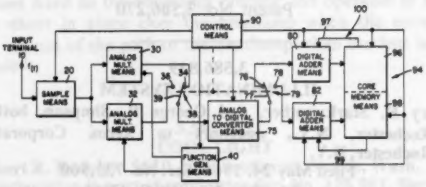
**3,586,843**
**COMPUTER SYSTEM FOR PRODUCING VARIOUS FOURIER ANALYSES IN REAL TIME**

**Edwin A. Sloane, Los Altos, Calif., assignor to Ampex Corporation, Redwood City, Calif.**

**Continuation-in-part of application Ser. No. 379,611, July 1, 1964, now abandoned. This application Dec. 26, 1968, Ser. No. 786,869**
**Int. Cl. G06f *15/34***
**U.S. Cl. 235—156** **12 Claims**



A computer for realizing Fourier transformations utilizing the mathematical realization that the Fourier transform can be synthesized by a sampling technique, wherein any sample of a time function can be described in the frequency or complex frequency domain by, for example, a sine and cosine function having a periodicity with respect to frequency that is proportional to the displacement of the sample from a selected time zero, multiplied by an amplitude proportional to the magnitude of the respective sample. In the basic embodiment the apparatus elements provide for the summation of the products of the sample amplitude and the appropriate sine and cosine function, whereby a continuous up-to-date Fourier transformation is available for all of the sampled time functions presented to the computer at any point in time.

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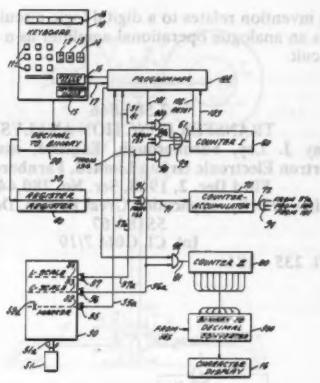
**3,586,844**
**ELECTRONIC SLIDE RULE**

**Richard B. Hanbicki, Princeton Junction, N.J., assignor to Madatron-Princeton, Inc., Rocky Hill, N.J.**

**Filed June 5, 1968, Ser. No. 734,670**
**Int. Cl. G06f *7/52***
**U.S. Cl. 235—167** **11 Claims**



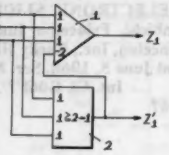
A system for performing mathematical computations based upon logarithmic principles. A magnetic drum, or other suitable memory means, is provided with pulses spaced in logarithmic fashion to represent the C-scale. The second track of the memory is provided with pulses spaced in such a manner as to represent the L-scale. The performance of a multiplication operation, for example, takes place by: inserting the multiplicand and multiplier into two registers; developing a count in accordance with the C-scale pulses in a first counter and simultaneously therewith inserting pulses from the L-scale track into an accumulator; terminating the count in the first counter and clearing the counter as soon as the count in the first counter and the multiplicand compare; when the first counter is cleared, pulses from the C and L-scale are then inserted into the first counter and the accumulator, respectively; this continues until the count in counter 1 compares with the multiplier in register B, at which time the operation is terminated; the count accumulated in the first counter is then cleared, and L-scale and C-scale pulses are then inserted into the first counter and a second counter, respectively; as soon as the count in the first counter compares with the count in the accumulator, the operation is terminated and a binary-to-decimal converter is activated, coupling the output of the second counter to a character display and/or printer for visual observation. A division operation is performed in a similar manner, except that the L-scale pulses representing the divisor are subtracted from the first group of pulses accumulated, representing the dividend. Operations such as sine, cosine and tangent functions may be performed in a similar manner.

**3,586,845**

## BINARY FULL ADDER UTILIZING OPERATIONAL AMPLIFIERS

**Yasuo Komamiya, Yokohama; Kazuo Kurokawa, Tokorozawa-shi; Tatsuo Goto, Tokyo; Ryoichi Mori, Tokyo, and Hiraoki Tajima, Tokyo, all of, Japan, assignors to Agency of Industrial Science and Technology, Chiyoda-ku, Tokyo, Japan**

**Filed Sept. 6, 1967, Ser. No. 665,809**
**Claims priority, application Japan, Sept. 13, 1966, 41/60,149**
**Int. Cl. G06f** *7/385*
**U.S. Cl. 235—172** **7 Claims**



This invention relates to a digital logic circuit which incorporates an analogue operational amplifier as a component of the circuit.

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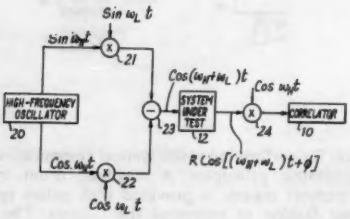
**3,586,846**

## TRANSFER FUNCTION ANALYSIS

**Anthony J. Ley, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, England**

**Filed Dec. 2, 1968, Ser. No. 780,448**
**Claims priority, application Great Britain, Dec. 5, 1967, 55184/67**
**Int. Cl. G06f** *7/19*
**U.S. Cl. 235—181** **9 Claims**




Testing the response of a system such as a servo to an input signal of a relatively high signal ($W_H$) while using a correlator which operates at relatively low frequencies (e.g. $W_L$). A signal of frequency $W_H$ and a signal of frequency ($W_H+W_{LH}-W_L$) are generated and one of these is applied to the system under test. The other signal is multiplied by the output signal from the system, and the thus-formed multiplied signal is compared with two signals of frequency $W_L$ which differ in phase. The signal of frequency ($W_H \pm W_L$) can be generated by multiplying each of two signals of frequency $W_H$ which differ in phase by a respective one of two signals of frequency $W_L$ which differ in phase, and adding (or subtracting) the thus-formed multiplied signals.

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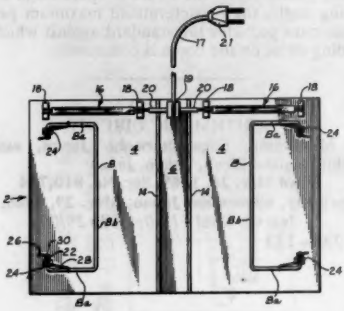
**3,586,847**

## BOOK HOLDER

**Morris Nahmias, 419 Golflane, Indianapolis, Ind.**

**Filed May 7, 1969, Ser. No. 822,673**
**Int. Cl. A47b** *97/04;* **F21v** *33/00*
**U.S. Cl. 240—2** **1 Claim**

A book holder having a pair of opposing covers wherein said opposing covers are connected to an intermediate panel by means of a pair of hinges. Each cover is equipped with a light which is adapted to illuminate reading material positioned thereunder. Each cover is also equipped with a book holding means, which is of a U-shaped bracket type and which is spring-biased into position.



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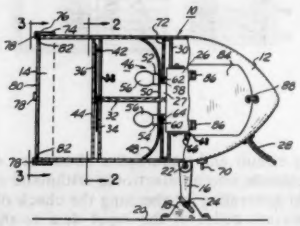
**3,586,848**

## ILLUMINATED CLOCK

**William H. Loftis, 359 Maxlow, Hazel Park, Mich.**

**Filed Nov. 26, 1968, Ser. No. 779,134**
**Int. Cl. G04b** *19/30;* **F21v** *9/00*
**U.S. Cl. 240—2.1** **1 Claim**



An illuminated clock specifically for use in a photographic darkroom or similar confines, where protection against certain light rays is of necessity, composed of a housing including an illuminated time dial provided with means to interchangeably mount light ray absorbing filters within the housing in front of the illuminated dial to screen out and dampen the radiation of optical wavelengths emanating from the illuminated dial.

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## ERRATUM

For Class 240—003 see:
Patent No. 3,586,270

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**3,586,849**

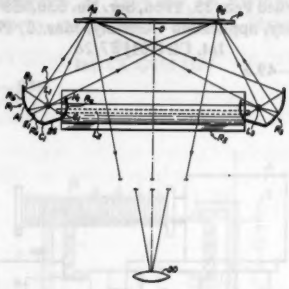
## ILLUMINATION SYSTEM

**Gary K. Starkweather, and George R. Simpson, both of Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.**

**Filed May 24, 1968, Ser. No. 731,960**
**Int. Cl. F21v** *7/00;* **G03b** *27/54*
**U.S. Cl. 240—41.35** **9 Claims**

An illumination system having four lamps arranged orthogonally around a subject to be illuminated with each lamp positioned outside the corresponding adjacent edge of

the subject. A bireflector having cylindrical and/or ellipsoidal surfaces is associated with each of the lamps for directing



light rays to the subject from the adjacent edge thereof to the edge opposite thereto.

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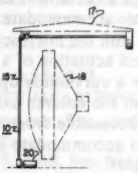
**3,586,850**
**FOG PENETRATOR OR SIMILAR ARTICLE**
**Webster W. Curtiss, Route #2, Caldwell, Idaho**
**Filed June 13, 1969, Ser. No. 833,050**
**Int. Cl. F21v** *11/18, 17/04*
**U.S. Cl. 240—46.03** **3 Claims**



A roller shadelike monochromatic film sheet lens operable to diffuse and to shorten the light wavelengths of automotive vehicle head lamps, the lens being mounted to and normally carried by commonly known moveable headlamp covers of automotive vehicles. The shadelike lens is provided with a spring-loaded extensible means at one of its terminal ends which is mounted to the cover and with a slotted latching bar means suitably fastened to the cover at the terminal end opposite the extensible means, the slotted portion being operable to guide the lens therethrough and to normally hold the lens to the cover by a pair of eyelets provided at the opposite terminal end of the lens which are engageable with a locking means fixed to the headlamp housing and operable to hold the sheet in place over the headlamp when the cover is moved out of the path of the headlamp when the lens is extended.

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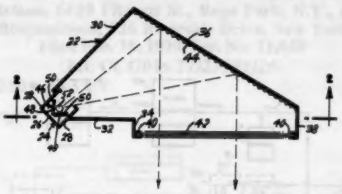
**3,586,851**
**COOL LIGHT**
**Robert R. Rudolph, 9610 22nd Southwest, Seattle, Wash.**
**Continuation-in-part of application Ser. No. 328,961, Dec. 9, 1963, now abandoned. This application Feb. 24, 1969, Ser. No. 805,981**
**Int. Cl. G01m** *3/08*
**U.S. Cl. 240—47** **1 Claim**

A device for producing cool light utilizing a dichroic reflector wherein the reflected visible light is directed to a



second reflector which redirects the light to a diffuser.

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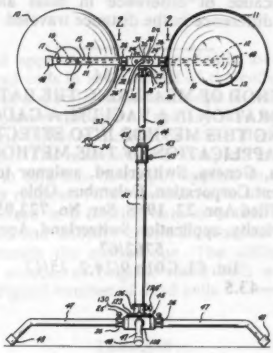
**3,586,852**
**ELECTRIC LIGHT HOLDER**
**Bobby E. Bradley, 1419 Westmoor, Austin, Tex.**
**Filed June 17, 1968, Ser. No. 737,414**
**Int. Cl. F21s** *1/12*
**U.S. Cl. 240—81** **2 Claims**



Portable electric light holder having a tubular (telescopic) standard connected at its upper end to bottom plate of box having plates forming bottom and sides thereof, the latter being connected to tubular arms carrying reflector-lamp socket units. A support including a plate is connected to lower end of standard. The support in one form comprising second box having plates forming top and side thereof, the latter being connected to tubular legs radiating from the standard. Plates have apertures where tubular members are connected thereto by means of tubular connectors, each telescoped at one end over one of tubular members and secured thereto by set screw and having the other end connected to plate by threaded means. Electric conductors extend from sockets through arms into first box and thence to power source.

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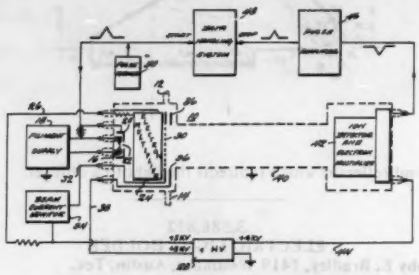
**3,586,853**
**AXIAL BEAM TIME OF FLIGHT MASS SPECTROMETER**
**Marvin L. Vestal, Baltimore, Md., assignor to Scientific Research Instruments Corporation, Baltimore, Md.**
**Filed Nov. 14, 1968, Ser. No. 775,680**
**Int. Cl. H01j** *39/34*
**U.S. Cl. 250—41.9 SB** **4 Claims**

A time of flight mass spectrometer wherein the ionizing electron beam is in axial alignment with the path of the ions produced thereby and wherein an electron multiplier is utilized to generate a high intensity electron beam for ionization. An open mesh control grid is utilized to control the axial dimension of the ionization region so that it can be maintained very small in order that the distance traveled by each of the ions to an ion detector at the opposite end of a drift tube is very nearly the same. This will result in a more accu-

rate measurement of the mass of the ions since the difference in travel time to reception by the ion detector will be



primarily because of difference in mass alone and not because of a difference in the distance traveled.

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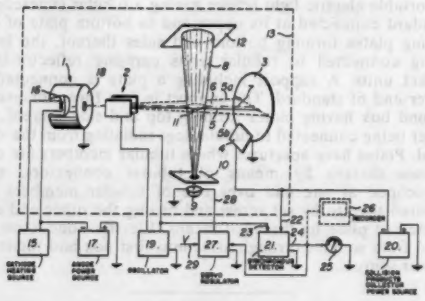
**3,586,854**

## METHOD OF MEASURING THE RATE OF EVAPORATION IN A VACUUM, A GAUGE FOR CARRYING THIS METHOD INTO EFFECT, AND AN APPLICATION OF THIS METHOD

**Bogdan Zega, Geneva, Switzerland, assignor to The Battelle Development Corporation, Columbus, Ohio**

**Filed Apr. 22, 1968, Ser. No. 722,951**
**Claims priority, application Switzerland, Apr. 21, 1967, 5762/67**
**Int. Cl. G01n *9/24;2, 23/12***
**U.S. Cl. 250—43.5** **14 Claims**



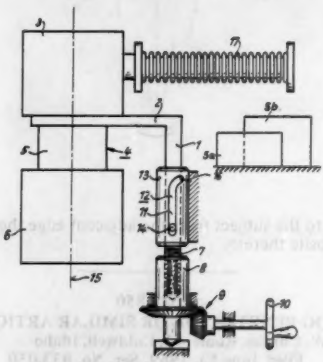
A method and apparatus for measuring the evaporation rate of substances which involves vaporizing the substance, generating a jet of the vapor in an evacuated enclosure, scanning through a cross section of the vapor jet with a beam of electrons, collecting the collision products generated during scanning, thereby giving rise to a current having a continuous component due to electrons colliding with the residual gas present in the enclosure and a periodic component due to electrons colliding with the vapor jet, and separating the continuous component from the periodic component, the amplitude of the latter being the measure of the numerical density of the vapor jet.

**3,586,855**

## CORPUSCULAR RAY MICROSCOPE WITH MEANS TO INSERT SPECIMEN CHAMBERS OF VARIOUS SIZES IN THE COLUMN THEREOF

**Ekkehard Fuchs, Munich, Germany, assignor to Siemens & Halske Aktiengesellschaft, Berlin, Germany**

**Filed Feb. 25, 1966, Ser. No. 530,055**
**Claims priority, application Germany, Mar. 2, 1965, S95,735**
**Int. Cl. H01j *37/26***
**U.S. Cl. 250—49.5** **3 Claims**



A specimen chamber exchange device in a corpuscular ray microscope having a microscope column with a top portion, specimen chamber and a lower portion. A lifting mechanism raises the top portion a rectilinear distance above the lower portion sufficient to accommodate the highest specimen chamber to be used with the microscope. Upon reaching this elevation, a continued actuation of a drive means causes the top portion to follow a curvilinear upward path which moves it laterally away from the column axis thereby rendering the specimen chamber accessible from above. The top portion can be positioned to accommodate any of several chambers having different heights.

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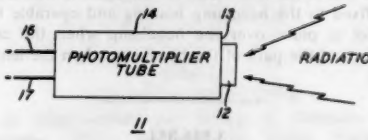
**3,586,856**

## RADIATION DETECTOR USING ISOELECTRONIC TRAP MATERIAL

**Walter L. Brown, Berkeley Heights; Thomas C. Madden, Chester; James L. Merz, New Vernon; Gabriel L. Miller, Westfield, and David G. Thomas, Summit, all of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed Mar. 15, 1968, Ser. No. 713,539**
**Int. Cl. G01t *1/20***
**U.S. Cl. 250—71.5** **4 Claims**



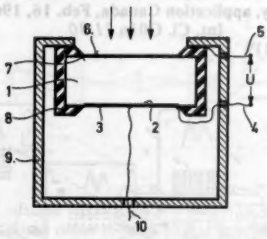

11

A radiation detection arrangement comprises a member of material characterized by isoelectronic traps which emit light upon bombardment by radiation to be detected. A suitable photoresponsive device converts the light thus emitted into electrical signals.

## 3,586,857
## SEMICONDUCTOR ELECTRON DETECTOR

Peter Glasow, Nurnberg, and Prabuddha Banerjee, Karlsruhe, both of, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Apr. 21, 1969, Ser. No. 817,672
Claims priority, application Switzerland, May 30, 1968, 8647/68
Int. Cl. G01t *1/24*
U.S. Cl. 250—83R 4 Claims

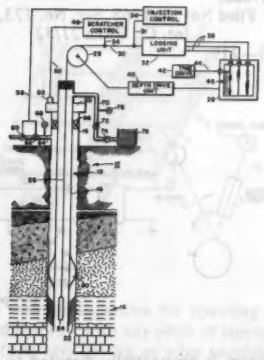



An electron detector particularly adapted to sense low energy radiation, includes a semiconductor crystal having a face directly exposed to the electrons to be detected and provided over its area with an electrode constituted by a light impervious, but electron pervious layer. The crystal further has another face, also carrying an electrode. Within the crystal there is an active zone which, generated by a voltage applied by the electrodes in a blocking direction, extends through the entire crystal between the electrodes.

## 3,586,858
## PERMEABILITY MEASURING SYSTEM

Arthur H. Youmans, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 17, 1968, Ser. No. 698,530
Int. Cl. G01t *3/00*
U.S. Cl. 250—83.1 4 Claims

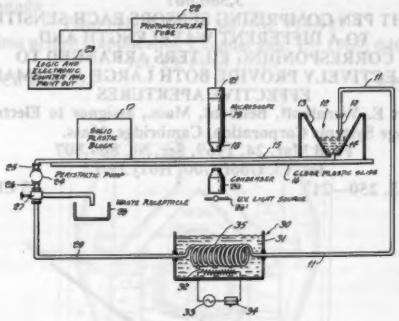


This system permits the measurement of permeability of subsurface formations in situ injecting a neutron absorber fluid and observing the progressive change in the thermal neutron absorption cross section.

## 3,586,859
## FLUORESCENT CELL VIABILITY COUNTER

Irwin J. Katz, 1199 East 53rd St., Brooklyn, N.Y.; Nicholas M. Satriano, 6410 Fitchett St., Rego Park, N.Y., and Morris A. Benjaminson, 626 Riverside Drive, New York, N.Y.

Filed Feb. 16, 1970, Ser. No. 11,628
Int. Cl. G01n *21/22, 21/26*
U.S. Cl. 250—83.3 UV 9 Claims

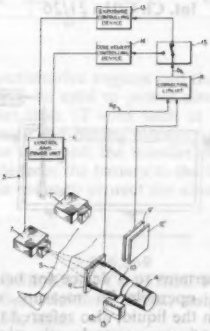


Method and apparatus for automatically ascertaining the number of dead cells in a batch. All of the cells in the batch are stained with a specific fluorescent dye in a reservoir, then the cells are passed through a capillary tube by means of a peristaltic pump under a microscope while illuminated by an ultraviolet light. The microscope is coupled to a photomultiplier which in turn has its output applied to an electronic counter with a readout. After the dead cells are counted, the batch is immersed in a heating bath in which all the viable cells are killed and another count is obtained by repassing the batch beneath the microscope. The difference in the counts is the number of original viable cells while the first count is the original number of dead cells.

## 3,586,860
## X-RAY PLANT FOR BOTH RADIOSCOPY AND PHOTOGRAPHY

Soren Borje Edhard Borjesson, Huskvarna; Rolf Gosta Nyden, Bankeryd, and Stig Arne Ohlsson, Jonkoping, all of, Sweden, assignors to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Apr. 4, 1969, Ser. No. 813,661
Claims priority, application Sweden, Apr. 8, 1968, 4682/68
Int. Cl. G03b *41/16*
U.S. Cl. 250—95 3 Claims



Plural transducer elements, comprising a single transducer, are associated with an X-ray tube to produce an output

which varies with average intensity of X-ray radiation. The transducer element outputs are summed, averaged and amplified, and are corrected for factors common to both radioscopy and photography, then fed, through a selector switch, either to a dose velocity controlling device which maintains radiation intensity at a desired level for radioscopy, or to an exposure controlling device which times photographic exposures.

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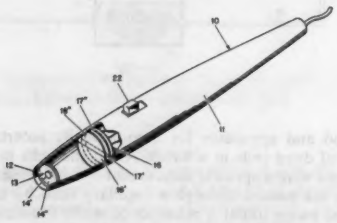
**3,586,861**

**LIGHT PEN COMPRISING SENSORS EACH SENSITIVE TO A DIFFERENT WAVELENGTH AND CORRESPONDING FILTERS ARRANGED TO SELECTIVELY PROVIDE BOTH LARGE AND SMALL EFFECTIVE APERTURES**

**Robert E. Wernikoff, Belmont, Mass., assignor to Electronic Image Systems Corporation, Cambridge, Mass.**

**Filed Mar. 24, 1969, Ser. No. 809,807**
**Int. Cl. G06f *3/00*; H01j *39/12***
**U.S. Cl. 250—217** **3 Claims**



The disclosed light pen has a high resolution state and a low resolution state, either of which may be quickly and easily selected. When used to define locations on a cathode-ray tube display device, the low resolution state is particularly useful for erasing or other operations where a large area designation capability is preferable; the high resolution state is useful for pointing and other operations where it is desired to precisely define a location. The disclosed light pen is realized by incorporating plural sensing means each sensitive to a different wavelength of radiation and corresponding large and small areas subtending the aperture each of which transmits the wavelength to which a corresponding sensing means is sensitive. This facilitates electrically switching between a large effective aperture and a small effective aperture.

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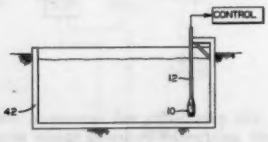
**3,586,862**

**APPARATUS FOR CONTINUOUS DETECTION AND MEASUREMENT OF SUSPENDED SOLIDS IN LIQUIDS**

**George J. Topol, Reston, Va., assignor to Keene Corporation, New York, N.Y.**

**Filed Sept. 15, 1969, Ser. No. 857,921**
**Int. Cl. G01n *21/26***
**U.S. Cl. 250—218** **14 Claims**




The invention pertains to a device for being inserted in a liquid and being operable to measure or analyze the suspended solids in the liquid, also referred to as turbidity of the liquid. The device operates by directing light into the liquid and measuring the amount of the light reflected by the solids in the liquid with a photocell. A second photocell more remote from the source of light than the first photocell can be employed to compensate for ambient light, and for light reflected from articles remote from the light source, or light which is reflected from the side of a vessel in which the device is located. A still further photocell may be employed which receives light from the light source through a relatively narrow body of the liquid being analyzed and can be employed as a calibrating standard.

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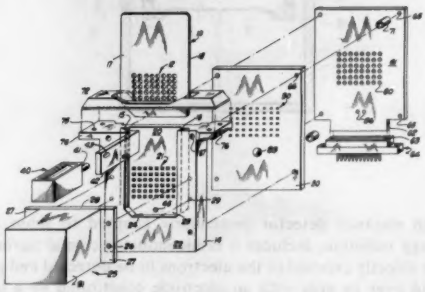
**3,586,863**

**PHOTOELECTRIC DEVICE FOR READING PUNCHED CARDS**

**Herbert Laks, St. Laurent, Quebec, Canada, assignor to Pylon Electronic Development Company, Ltd., Lachine, Quebec, Canada**

**Filed Feb. 12, 1968, Ser. No. 704,837**
**Claims priority, application Canada, Feb. 16, 1967, 983043**
**Int. Cl. G01n *21/30***
**U.S. Cl. 250—219** **1 Claim**



A photoelectric device for reading punched cards comprising a head having opposed slots for receiving a punched card. A matrix of holes in a back portion of the head is adapted to register with holes in the card. An opening in the front portion of the head exposes the matrix of holes to a light source which is adapted to actuate photocells disposed behind the back portion of the head in registry with the holes in the back portion of the head.

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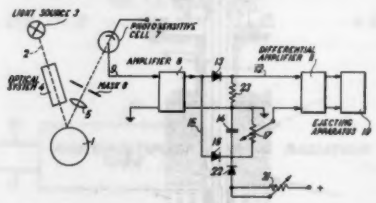
**3,586,864**

**APPARATUS AND METHOD FOR TESTING A BODY FOR SURFACE IRREGULARITIES**

**Jaroslav Brany; Jiri Panek, and Stanislav Havel, all of Prague, Czechoslovakia, assignors to Vyzkumny ustav strojirenske technologie a ekonomiky, Prague, Czechoslovakia**

**Filed Nov. 6, 1968, Ser. No. 773,900**
**Int. Cl. G01n *21/32***
**U.S. Cl. 250—219** **16 Claims**

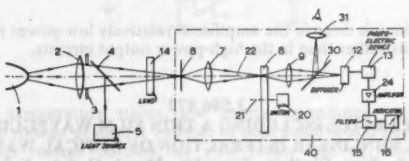



A light beam is sequentially directed to each part of the surface of a light reflective body and the reflected light beam is converted into an electrical signal corresponding in magnitude to the intensity of the reflected light beam. The electrical signal is stored and the electrical signal and the stored signal are compared in magnitude. A difference in magnitude of the signals indicates an irregularity in the surface of the body.

## 3,586,865
## METHOD OF, AND APPARATUS FOR, INSPECTING THE SHAPE OF SMALL OBJECTS

Lionel Richard Baker, Orpington; Peter Archer, West Wickham, and Patricia Ann West, Orpington, all of, England, assignors to British Scientific Instrument Research Association, South Chislehurst, Kent, England

Filed June 19, 1969, Ser. No. 834,779
Claims priority, application Great Britain, June 21, 1968, 29668/68
Int. Cl. H01j 39/12
U.S. Cl. 250—222 8 Claims

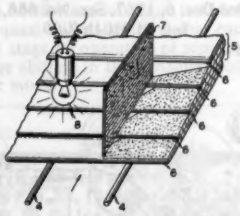


A method of and apparatus for ascertaining the profile, uniformity or some other related characteristic of a small object or part of a small object. An optical image of the part of the object under investigation, for example the cutting edge of a cutting tool, is formed and the distribution of intensity of radiation in the image which is formed by light reflected diffracted and/or scattered by the object is Fourier analyzed by optical scanning to provide an electrical signal representing the Fourier transform of the intensity of radiation in said image. A complete transform over a range of spatial frequencies can be provided. Alternatively once a reference transform is known a comparison can be made between the electrical signal produced by a standard object and that produced by the object under test at one or more spatial frequencies.

## 3,586,866
## APPARATUS FOR COUNTING SHEET-SUBSTANCES TRANSFERRED IN ROW OF LAPPING

Tomoshi Kawata, 935 Shinmarako, Higashi 3-Chome, Kawasaki, Japan

Filed Sept. 11, 1969, Ser. No. 857,111
Int. Cl. G06m 7/10
U.S. Cl. 250—222 2 Claims



In combination with an apparatus for counting sheet substances transferred in a row with any pitch of lapping, a partition plate for shutting rays having an edge touching the surfaces of the transferred substances and set in the direction of transference, a light source positioned at one side of said partition plate and a photoelectric converter positioned at the other side of said partition plate, so that rays filtering through the gap formed by the step at the lapping part of the transferred substances are sensed by said photoelectric converter which activates a counter.

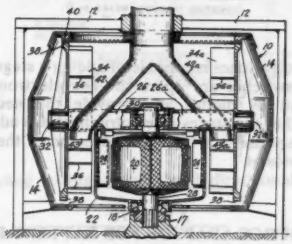
## ERRATUM

For Class 250—231 see:
Patent No. 3,586,665

## 3,586,867
## TURBINE HAVING A WHEEL ROTARY ABOUT A HORIZONTAL AXIS WITH SAID AXIS BEING ROTARY ABOUT A VERTICAL AXIS

Alban Maillet, Sainte-Marie de Kent, Nouveau-Brunswick, Canada

Filed Feb. 3, 1969, Ser. No. 795,957
Claims priority, application Canada, Jan. 15, 1969, 040,251
Int. Cl. F01d 15/10
U.S. Cl. 290—52 6 Claims

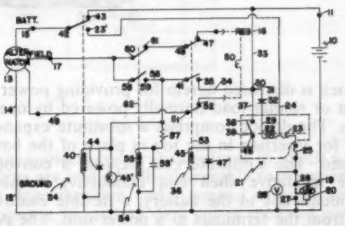


A generator in which a fluid is conducted to the center of a turbine wheel and radially outwardly to impinge upon the turbine vanes and cause the turbine wheel to turn about a horizontal axis and the wheel is journaled to a support member which in turn rotates about a vertical axis.

## 3,586,868
## ZERO CURRENT TRANSFER DEVICE

David Martens, and Henry Epp, both of Winnipeg, Manitoba, Canada, assignors to Genie Power Products Ltd., Winnipeg, Manitoba, Canada

Filed May 26, 1969, Ser. No. 827,499
Int. Cl. H02g 3/00
U.S. Cl. 307—10 28 Claims



A circuit for automotive engines and the like having an alternator which can be used to power direct current devices of voltages higher than 12 volts such as 110 volts, directly from the alternator and having circuitry whereby when the load is applied or removed, the transfer of the output of the alternator is made from the battery to the load and vice versa at zero current in order to protect the contact points and for safety.

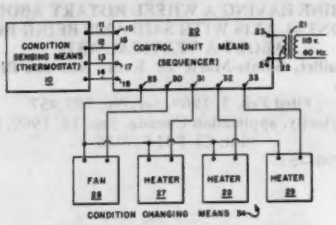
## 3,586,869
## SEQUENCING CONTROL UNIT

Arlon D. Kompelien, Richfield, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 8, 1969, Ser. No. 856,055
Int. Cl. H02j 3/00
U.S. Cl. 307—41 10 Claims

A sequencing type of control unit means particularly useful for sequencing stages of electric heat in response to a condi-

tion-sensing means or thermostat is disclosed. The sequencing type of control unit has an increasing current flow created within it in response to a variation of the condition-sensing thermostat, and this increasing current flow is directed to a number of bistable electronic switches. Each of




the electronic switches is capable of adding a stage of electric heat as the switches are operated. The electronic switches are separated by diodes and provide the necessary differential so that the stages of electric heat are added or subtracted in response to a change in demand of the condition-sensing thermostat.

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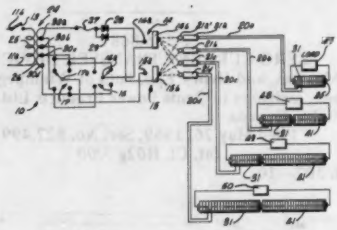
**3,586,870**

## POWER SOURCE ADAPTOR FOR BATTERY POWERED DEVICES

**Donald N. Cwiak, 6538 Blucher Ave., Van Nuys, Calif.**

**Filed Nov. 3, 1969, Ser. No. 873,559**
**Int. Cl. H02j 7/00**
**U.S. Cl. 307—66** **7 Claims**



A device is disclosed herein for providing power to a toy, flashlight or similar load normally powered by one or more batteries. The device comprises a substitute expandable cell adapted for insertion in the toy in place of the battery normally used. The substitute cell includes a convoluted, expandable insulative shell and conductive terminals configured identically to the battery, a flexible electrical cable leading from the terminals to a power unit. The power unit comprises a power supply accepting household AC voltage and providing a DC output equal in voltage to that supplied by the batteries being replaced.

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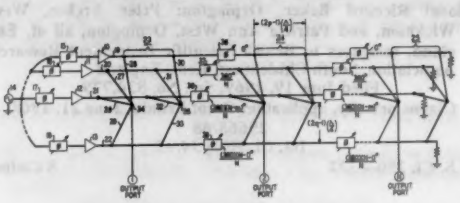
**3,586,871**

## PHASE RESPONSIVE SWITCHING SYSTEM

**Harold Seidel, Warren Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Murray Hill, Berkeley Heights, N.J.**

**Filed May 23, 1969, Ser. No. 827,423**
**Int. Cl. H02j 1/00; H01q 3/24**
**U.S. Cl. 307—87** **6 Claims**

The power derived from N identical power amplifiers are combined in any one of N different output ports by controlling the relative phases of the signals propagating along N different transmission lines energized, respectively, by the N amplifiers. In particular, the N output ports are longitudinally distributed along said lines, and are coupled thereto through networks that are responsive to a different mode of excitation, where each mode is a different arrangement of input signal phases. It is an advantage of such a system that all the



switching is done in the amplfiiers' relatively low-power input circuits rather than in the high-power output circuits.

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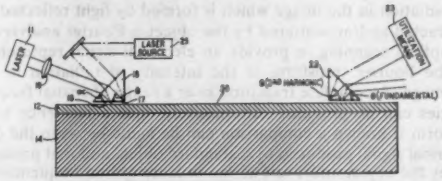
**3,586,872**

## APPARATUS INCLUDING A THIN FILM WAVEGUIDE FOR NONLINEAR INTERACTION OF OPTICAL WAVES

**Ping K. Tien, Chatham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, Berkeley Heights, N.J.**

**Filed Apr. 21, 1969, Ser. No. 817,678**
**Int. Cl. H03f 7/00**
**U.S. Cl. 307—88.3** **4 Claims**




Nonlinear interaction of optical waves is achieved in a thin film waveguide by exciting appropriate modes of the waves to be interacted whereby phase matching is achieved in the substrate between the evanescent fields of the waves. The desired modes are excited by use of internal-reflection prism coupling in the manner described in copending application Ser. No. 793,696 filed Jan. 24, 1969.

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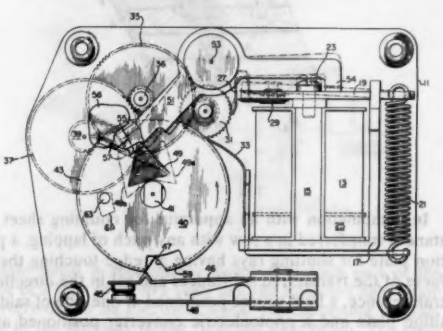
**3,586,873**

## ELECTRIC TIMER

**Carmen P. Cairelli, Farmington, Conn., assignor to Dynamics Corporation of America, New York, N.Y.**

**Filed Dec. 6, 1967, Ser. No. 688,492**
**Int. Cl. H01h 7/00**
**U.S. Cl. 307—141** **3 Claims**



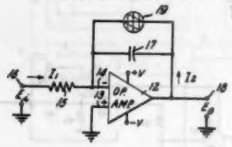
An electrical appliance timer having a vibratory ratchet drive coupled to a solenoid-operated armature.

3,586,874

## INTEGRATED CIRCUIT PERIODIC RAMP GENERATOR

Armand P. Ferro, Troy, N.Y., assignor to General Electric Company

Filed Aug. 13, 1969, Ser. No. 849,810
Int. Cl. H03k 17/00
U.S. Cl. 307—228 3 Claims



A temperature stable, low source impedance periodic ramp voltage generator capable of both positive and negative output voltage polarity, or only either one of these, is fabricated in large part as an integrated circuit. The generator comprises the combination of an operational amplifier used as an integrator and a bilateral or unilateral voltage-sensitive switching device, such as a silicon bilateral switch or a silicon unilateral switch, for periodically discharging the feedback capacitor of the integrating circuit.

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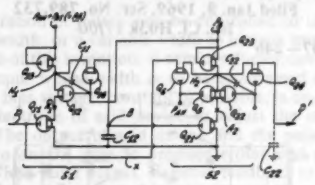
3,586,875

## DYNAMIC SHIFT AND STORAGE REGISTER

James P. Nicklas, Woodland Hills, Calif., assignor to Electronic Arrays, Inc., Woodland Hills, Calif.

Filed Sept. 19, 1968, Ser. No. 760,781
Int. Cl. G11c 19/00; H03k 23/08
U.S. Cl. 307—221 3 Claims



A dynamic shift register, for example, of the large scale integrated circuit, MOS transistor-type, is described which can be operated as quasi-static register in that each bit circulates within the same stage by operation of separate clock operating for interstage shifting in the dynamic mode but inhibited during the static mode.

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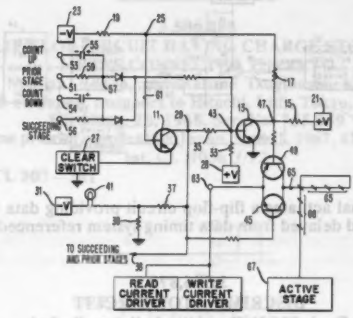
3,586,876

## ADDRESS COUNTER STAGE CIRCUITRY

George R. Cogar, R.D. #3, Frankfort, N.Y.

Filed Feb. 28, 1966, Ser. No. 534,583
Int. Cl. G11c 19/00; H03k 21/00
U.S. Cl. 307—221 8 Claims

The present device is a stage of a data processing register which is capable of either incrementing or decrementing, depending upon the conditions of the previous or succeeding stages. The present device incorporates a bistable device which provides two identical output signals when the bistable device is in one condition and provides two other kinds of output signals each of which is different from the other and different from the first mentioned output signal when the bistable device operates in the second condition. The output signals are coupled to a bidirectional current driver composed of two conducting elements and operate on that bidirectional current driver such that when the bistable device is in the first condition the bidirectional current driver has either conducting element available for operation while when the bistable device is in the second condition both of




the conducting elements of the bidirectional driver are turned off.

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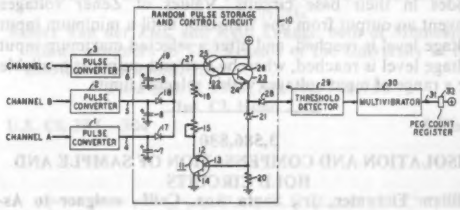
3,586,877

## PULSE SUMMARIZER CIRCUIT COMPRISING PLURAL CAPACITORS AND SINGLE CONSTANT CURRENT DISCHARGE MEANS FOR PULSE DATA ON PLURAL INPUT CHANNELS

Efstratios J. Aridas, Oakhurst, N.J.

Filed Nov. 26, 1969, Ser. No. 880,276
Int. Cl. H03k 4/08
U.S. Cl. 307—228 16 Claims




Pulse summarizer circuitry is disclosed in which a plurality of capacitors are individually chargeable to a regulated voltage for a fixed duration under control of pulse converters and in response to random data pulses received over a plurality of different communication channels. A single constant current circuit discharges each of the charged capacitors to produce linear negative ramp signals indicative of the number of received data pulses. The ramp signals activate a threshold detector and multivibrator to produce a summary of the random data pulses on an electromechanical peg count register.

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3,586,878

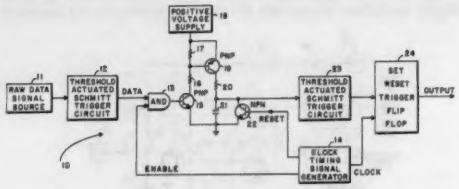
## SAMPLE, INTEGRATE AND HOLD CIRCUIT

Kenneth Y. Maxham, Richardson, Tex., assignor to Collins Radio Company, Dallas, Tex.

Filed Mar. 17, 1969, Ser. No. 807,758
Int. Cl. H03k 17/60
U.S. Cl. 307—234 12 Claims

A signal sample, integrate, and hold circuit with data signal samples AND enabled to generally insure that when a signal is coexistent with the enable signal only a portion of the data bit truly predictably present in certain data bit cycle periods is passed to an integrating circuit with charging of a capacitor

thereby to and through a triggering circuit threshold voltage actuating level. The triggering circuit in turn along with a clock signal actuates a flip-flop circuit providing data output one period delayed from data timing system referenced.

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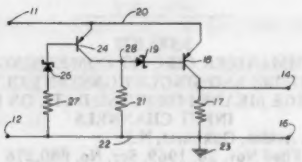
**3,586,879**

**DISCRIMINATOR CIRCUIT**

**Donald L. Ford, 226 N. Rural St., Indianapolis, Ind.**

**Filed Oct. 10, 1968, Ser. No. 766,478**
**Int. Cl. H03k** *5/20*
**U.S. Cl. 307—235** **5 Claims**



Two normally nonconducting transistors are connected across an input, both being held nonconducting by Zener diodes in their base circuits. Values of Zener voltages prevent an output from one transistor until a minimum input voltage level is reached, and after a selected maximum input voltage level is reached, whereby a circuit output is available for a range of input voltages within selected limits.

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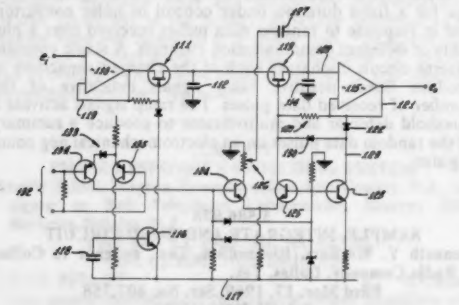
**3,586,880**

**ISOLATION AND COMPENSATION OF SAMPLE AND HOLD CIRCUITS**

**William Fitzwater, Jr., Santa Ana, Calif., assignor to Astrodata, Inc., Anaheim, Calif.**

**Filed Aug. 11, 1969, Ser. No. 848,813**
**Int. Cl. H03k** *17/00*
**U.S. Cl. 307—238** **11 Claims**



The invention concerns a sample and hold circuit including charge storage capacitors and switches connected between input and output amplifiers and operable to provide substantially improved isolation of a hold capacitor from the input amplifier, as during the hold period, and also to provide compensation for the transient jump in voltage developed at the hold capacitor during switching.

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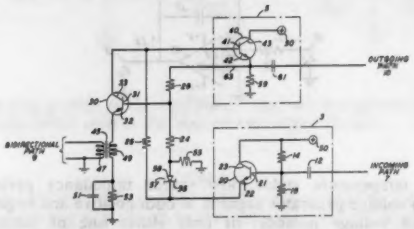
**3,586,881**

**TRANSISTOR HYBRID CIRCUIT**

**Wilmer B. Gaunt, Jr., Boxford, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 29, 1967, Ser. No. 694,464**
**Int. Cl. H04b** *3/38*
**U.S. Cl. 307—241** **5 Claims**




A transistor hybrid circuit for exchanging signals between the incoming and outgoing paths of a four-wire line and a two-wire line is described. A signal from the incoming path is coupled via an amplifier and the base-emitter path of a coupling transistor to the two-wire line. An outgoing signal from the two-wire line is coupled via the emitter-collector path of the coupling transistor and a second amplifier to the outgoing path. A resistor network connected to the coupling transistor prevents the signal from the incoming path from being applied to the outgoing path.

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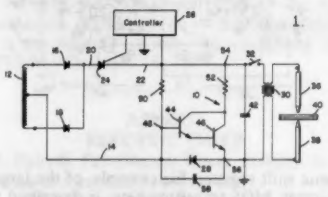
**3,586,882**

**CAPACITOR BLEED CIRCUIT**

**Malcolm M. Oakes, Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.**

**Filed Jan. 8, 1969, Ser. No. 789,732**
**Int. Cl. H03k** *17/00*
**U.S. Cl. 307—246** **3 Claims**




Detecting means detects current flow to a capacitor. When capacitor charging current stops, cessation of charging current is detected, and a quick dump bleed path is connected in parallel to the capacitor.

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**3,586,883**

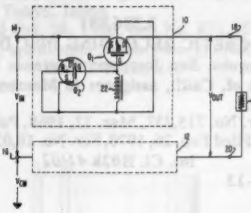
**HIGH VOLTAGE MOS-FET ANALOG SWITCHING CIRCUIT WITH FLOATING DRIVE**

**Robert A. Hayes, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 31, 1969, Ser. No. 889,495**
**Int. Cl. H03k** *17/60*
**U.S. Cl. 307—251** **2 Claims**

An MOS-FET switching circuit for high voltage, bipolar, common mode analog input signals. The source-drain terminals of a switching transistor are connected in series in the signal path, and a transformer secondary winding supplying a floating drive signal is connected across the transistor gate-body terminals. The drain-source terminals of a control transistor are connected between the source terminal of the switching transistor and one end of the transformer winding to isolate the input signal from the gate terminal of the

switching transistor. When a drive signal is applied, the control transistor turns on which places the drive signal across



the source-gate terminals of the switching transistor to turn the latter on in a positive manner.

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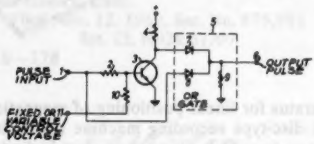
**3,586,884**

**CIRCUIT TO CONTROL THE DURATION OF PULSES**

**Gerhard Gunter Gassmann, Berkheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.**

**Filed Dec. 23, 1968, Ser. No. 785,892**
**Claims priority, application Germany, Jan. 25, 1968, P 15 62 019.6**
**Int. Cl. H03k *1/18***
**U.S. Cl. 307—265** **10 Claims**




The duration of pulses may be controlled to have a given constant width, or a variable width to convey intelligence by the circuit of this invention. A semiconductor device receives a pulse input whose width is to be maintained constant or varied. A bias voltage, constant or variable, is coupled to the control electrode of said device to adjust the storage time thereof. The output of said device and the pulse input are coupled to an OR gate to produce either said constant or variable width pulse output. Negative feedback to the control electrode may be employed to compensate the pulse output for temperature variations.

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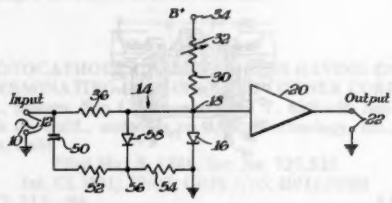
**3,586,885**

**SQUARE WAVE GENERATOR**

**Robert L. Dudley, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Mar. 20, 1969, Ser. No. 808,788**
**Int. Cl. H03k *5/04***
**U.S. Cl. 307—268** **2 Claims**




A sine wave is applied to a negative resistance element which converts the sine wave into a square wave. Both positive and negative portions of the sine wave are applied to the negative resistance element through an input resistor. In addition, the negative portions are applied to the negative resistance element through a high pass filter circuit including a series coupled capacitor, resistor and diode. The high pass filter circuit permits the negative portions of the sine wave at high frequencies to pretrigger the negative resistance device, thereby to enhance the symmetry of the square wave output.

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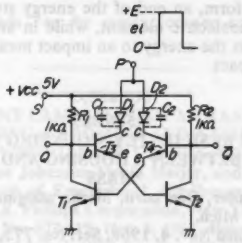
**3,586,886**

**FLIP-FLOP CIRCUIT HAVING CHARGE STORAGE MEANS CONNECTED THERETO**

**Kosei Nomiya, Tokyo, and Hazime Tsugihashi, Kodaira-shi, both of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Aug. 28, 1968, Ser. No. 755,859**
**Claims priority, application Japan, Sept. 1, 1967, 42/55800**
**Int. Cl. H03k *3/12***
**U.S. Cl. 307—281** **6 Claims**




A flip-flop circuit in which the input and output terminals of two transistorized switching stages are cross-coupled mutually through the emitter-base junctions of a pair of transistors and a trigger input signal is commonly applied to the collectors of said pair of transistors, through a pair of carrier storage diodes.

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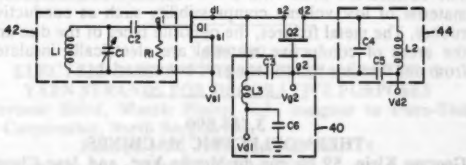
**3,586,887**

**TETRODE FET NOISE FIGURE BY NEUTRALIZATION AND TUNING**

**Aldert Van der Ziel, and Keiji Takagi, both of Minneapolis, Minn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.**

**Filed Jan. 3, 1969, Ser. No. 788,758**
**Int. Cl. H04b *1/12***
**U.S. Cl. 307—304** **5 Claims**




A tetrode field effect transistor capable of having an improved noise figure is shown. Circuitry is shown for neutralizing the drain-to-gate capacitance of the first half of the tetrode near cutoff frequency, and circuitry is also shown for tuning the interstage network between the first and second half of the tetrode field effect transistor.

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**3,586,888**

**IMPACT TRANSDUCER SWITCH**

**Walter Dorfman, Warminster, Pa., assignor to Sperry Rand Corporation, New York, N.Y.**

**Filed Oct. 16, 1969, Ser. No. 866,802**
**Int. Cl. H04r *17/00***
**U.S. Cl. 310—8.3** **3 Claims**

An impact transducer switch includes a manually operable key, an energy storage spring, and a piezoelectric element. Upon actuation of the key, means is provided for moving said spring through a first range of movement where energy is stored in said spring, and for thereafter effecting release of

said spring at a predetermined point to cause release of said energy and impact of said piezoelectric element to cause an electrical signal to be generated by said piezoelectric element. In one form, an end of the energy storage spring impacts the piezoelectric element, while in another form, the spring transfers the energy to an impact means which in turn causes the impact.

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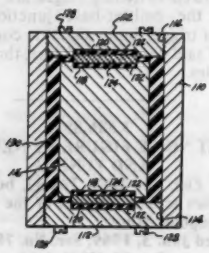
**3,586,889**

## MEANS FOR RESILIENTLY MOUNTING TRANSDUCER ELEMENTS BETWEEN A HOUSING AND AN INERTIAL MASS

**Roland K. Kolter, Dearborn, Mich., assignor to GCO, Inc., Ann Arbor, Mich.**

**Filed Nov. 4, 1968, Ser. No. 773,172**
**Int. Cl. H04r *17/00***
**U.S. Cl. 310—8.4** **3 Claims**



A piezoelectric disc of an electromechanical transducer is disposed between opposing cavities formed in metal fixtures. The cavities are filled with a resilient electrical conductive material of low volume compressibility such as conductive rubber. The metal fixtures, the opposite faces of the disc and the areas of conductive material are electrically insulated from one another by insulating rubber material.

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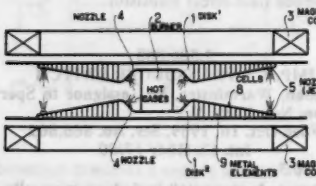
**3,586,890**

## THERMOELECTRIC MACHINES

**Georges Klein, 59 bis rue du Moulin Veet, and Jean-Claude De Simone, 76 bis rue des Plantes, both of Paris, France**

**Filed June 12, 1969, Ser. No. 832,661**
**Claims priority, application France, June 13, 1968, 154,920**
**Int. Cl. H02n *4/02***
**U.S. Cl. 310—11** **14 Claims**




The invention relates to a thermoelectric device including parallel, spaced discs axially of which is provided a plasma chamber with means being included for producing a magnetic field perpendicular to the discs and electrodes for collecting the current generated in the plasma.

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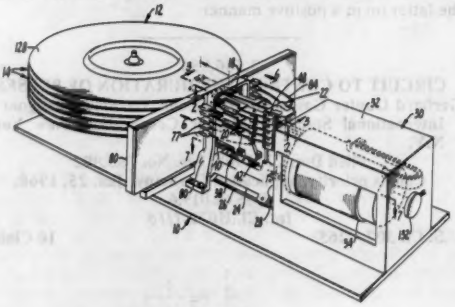
**3,586,891**

## MAGNETIC RECORDING DISC DRIVE

**Roy A. Applequist, San Jose, and Laurence M. Wilson, Los Gatos, both of, Calif., assignors to Memorex Corporation, Clara, Calif.**

**Division of Ser. No. 715,237, Mar. 22, 1968, Pat. No. 3,544,980.**
**Filed Feb. 26, 1970, Ser. No. 18,020**
**Int. Cl. H02k *41/02***
**U.S. Cl. 310—13** **2 Claims**



An apparatus for linear positioning of magnetic recording heads in a disc-type recording machine containing a linear positioning motor which converts an electrical address signal directly into linear motion, a rack and pawl mechanism for locking the recording heads at predetermined locations over the recording surface, a stationary cam cooperating with a loading ramp on a head access arm for direct head loading and unloading as the access arm is moved radially of the disc, and a recording head suspension which permits the heads to be loaded at the peripheral, high speed area of the disc rather than the central low speed area, while eliminating the need for control of tolerances during assembly of the apparatus.

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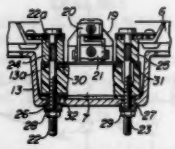
**3,586,892**

## AC CAR DYNAMO

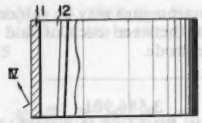
**Suguru Sato, Kariya-Sho, Japan, assignor to Nippon Denso Kabushiki Kaisha, Kariya-shi, Japan**

**Filed July 24, 1969, Ser. No. 844,309**
**Claims priority, application Japan, Sept. 24, 1968, 43/82772**
**Int. Cl. H02k *11/00***
**U.S. Cl. 310—68** **3 Claims**



An AC dynamo in which a rectifier, a voltage regulator and brush holders are disposed in stacked relationship, all these elements being secured to an end bracket of the dynamo by common securing means which provide electrical connection means between the elements as well as serve as electrical terminal means.

3,586,893
ARMATURE CORE
Harumichi Okamoto; Kiyoshi Fukui, and Teruo Oshima, all of Yokohama-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan
Filed Oct. 28, 1969, Ser. No. 871,852
Claims priority, application Japan, Nov. 2, 1968, 43/80069
Int. Cl. H02k *1/26*
U.S. Cl. 310—166 2 Claims




A moulded armature core comprises a moulded cylindrical block of magnetic material, having a plurality of slots disposed in parallel along the peripheral portion thereof in a manner to extend lengthwise of the block, said slots being so tapered as to progressively decrease in both depth and width.

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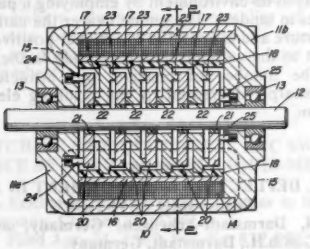
3,586,894
SERVOMOTOR
Philip M. Mueller, Derby, Kans., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Nov. 12, 1969, Ser. No. 875,891
Int. Cl. H02k *31/00*
U.S. Cl. 310—178 4 Claims



A homopolar machine provided with a plurality of electrically conductive rotor discs axially spaced and mounted on the shaft of the machine and a plurality of electrically conductive stator discs interleaved between the rotor discs and keyed against rotation to the housing. Adjacent stator and rotor discs are electrically in contact in a manner effectively connecting the rotor discs electrically in series. The torque or voltage developed by the machine is the sum of the torques or voltages developed in each rotor disc.

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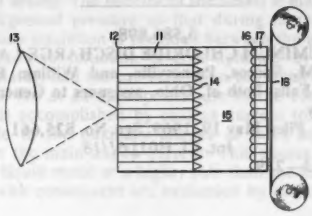
3,586,895
PHOTOCATHODE OF LIGHT FIBERS HAVING ENDS TERMINATING IN TRUNCATED CORNER CUBES
Hal L. Sowers, San Carlos, and John T. Balkwill, San Jose, both of, Calif., assignors to Optics Technology, Inc., Palo Alto, Calif.
Filed May 8, 1968, Ser. No. 727,525
Int. Cl. H01j *39/02*; G02k *5/16*; H01j *39/06*
U.S. Cl. 313—94 1 Claim

A multiple total reflection optical device is disclosed with angled ends on optical wave guides in a bundle of optical wave guides. In one embodiment a photocathode imaging system is disclosed wherein the terminal fused plate of a fiber optic bundle is selectively etched to produce a taper at the end of each fiber which is then coated with a photocathode material. Light conducted through the fibers undergoes multiple total reflections down the terminal taper and is dissipated with high efficiency in the photocathode material.




The tapered ends can be cones, corner cubes or other shapes.

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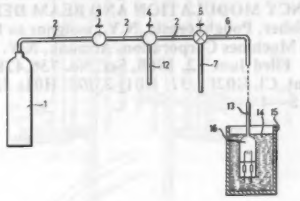
3,586,896
INCANDESCENT LAMPS HAVING A TRANSPORT GAS COMPRISING A BROMINE AND A CHLORINE HYDROCARBON COMPOUND
Riksterus Auguste Johannes Maria Meijer, and Germin Remi T'Jampens, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Phillips Corporation, New York, N.Y.
Division of Ser. No. 672,619, Oct. 3, 1967, Pat. No. 3,484,146.
Filed July 3, 1969, Ser. No. 838,781
Int. Cl. H01k *1/50*
U.S. Cl. 313—174 4 Claims




A regenerative cycle electric incandescent lamp having a tungsten filament and containing a transport gas essentially consisting of an inert gas and a bromine and chlorine hydrocarbon compound.

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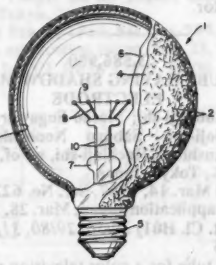
3,586,897
ELECTRIC LAMPS WITH LIGHT TRANSMITTING YARN STRANDS FOR DECORATIVE PURPOSES
Norman Baird, Morris Plains, N.J., assignor to Duro-Test Corporation, North Bergen, N.J.
Filed July 17, 1968, Ser. No. 747,775
Int. Cl. H01j *61/40*
U.S. Cl. 313—116 11 Claims




Electric lamps having a plurality of strands of a light transmitting yarn adhered thereto to produce a decorative effect.

The adhesive used to adhere the strands to the lamp envelope, the strands themselves, and/or another coating of material can be colored or pigmented to further enhance the decorative effect.

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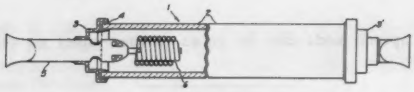
**3,586,898**

## ALUMINUM CHLORIDE DISCHARGE LAMP

**Dimitrios M. Speros, Painesville, and William E. Smyser, Chagrin Falls, both of, Ohio, assignors to General Electric Company**

**Filed May 19, 1969, Ser. No. 825,661**
**Int. Cl. H01j** *61/18*
**U.S. Cl. 313—229** **5 Claims**



A metal halide high intensity lamp containing $AlCl_3$ and providing a continuous spectrum. Excess aluminum in the filling gives thermodynamic stability against attack of the tungsten electrodes and other lamp metals by chlorine, and an alumina envelope is used which does not react with $AlCl_3$. The filling also preferably contains aluminum triiodide, mercury for a buffer gas, and an inert gas to facilitate starting.

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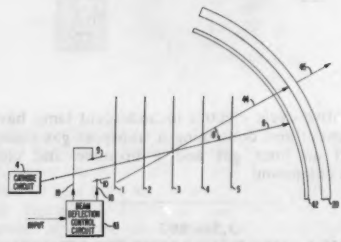
**3,586,899**

## APPARATUS USING SMITH-PURCELL EFFECT FOR FREQUENCY MODULATION AND BEAM DEFLECTION

**Harold Fleisher, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed June 12, 1968, Ser. No. 736,428**
**Int. Cl. G02f** *1/31*; **H01j** *25/00*; **H01s** *3/00*
**U.S. Cl. 315—4** **7 Claims**




An electron beam is deflected across the surface of a metallic grating to generate Smith-Purcell radiation. An amplifier which receives generated radiation from the grating from a predetermined direction will produce a frequency-modulated light or microwave beam. An amplifier which receives a signal of predetermined frequency and amplifies the signal at the angular position from which received serves as a beam deflector.

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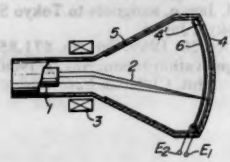
**3,586,900**

## COLOR TUBE HAVING SHADOW MASK LENS ELECTRODE

**Takeo Seki, Kokubunji-shi; Masao Sugawara, Tokyo; Sachio Takei, Hachioji-shi; Saburo Nonogaki, Tokyo, and Masakazu Fukushima, Hachioji-shi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Mar. 14, 1967, Ser. No. 622,996**
**Claims priority, application Japan, Mar. 28, 1966, 41/18728**
**Int. Cl. H01j** *29/56, 29/80, 31/20*
**U.S. Cl. 315—15** **13 Claims**

A cathode-ray tube for a color television receiver comprising three electron guns, a shadow mask having a plurality of holes, a shadow mask lens electrode arranged in the vicinity of said shadow mask and having electrically conductive portions in opposed relation to the holes in said shadow mask and a fluorescent screen, whereby an electron lens is formed in each hole in said shadow mask so that an electron beam



from each of said electron guns may be subjected to focusing action at any position between each of said holes and said shadow mask lens electrode.

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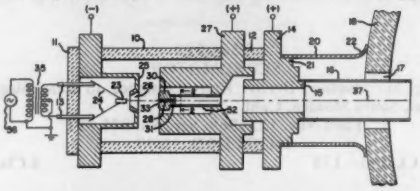
**3,586,901**

## ELECTRON GUN FOR USE IN CONTAMINATED ENVIRONMENT

**Bennie A. Findeisen, Baldwinsville, N.Y., assignor to General Electric Company**

**Filed June 4, 1969, Ser. No. 830,310**
**Int. Cl. H01j** *29/46*
**U.S. Cl. 315—14** **9 Claims**



The cathode of an electron gun is protected from gaseous contaminants in its environment by employing a pair of apertured anodes in tandem. The anode nearer the cathode has a smaller aperture and is operated at a higher positive potential with respect to the cathode than the anode farther from the cathode. The number of positive ions attracted to the cathode is sharply decreased by the resulting electric field configuration.

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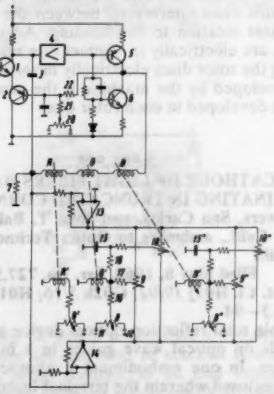
**3,586,902**

## VERTICAL DEFLECTION ARRANGEMENT IN A COLOR TELEVISION SYSTEM

**Emil Siegel, Darmstadt-Arheilgen, Germany, assignor to Fernseh G.m.b.H., Darmstadt, Germany**

**Filed July 25, 1969, Ser. No. 844,750**
**Claims priority, application Germany, July 30, 1968, P 17 62 656.1**
**Int. Cl. H01j** *29/76*
**U.S. Cl. 315—26** **6 Claims**



The vertical deflection coils in a color television system are series connected. Corrective deflection fields are supplied by

auxiliary windings, each made of much thinner wire than the corresponding deflection coil. Correction currents are supplied separately to each auxiliary winding. A resistor in series with the series-connected vertical deflection coils serves to supply a feedback voltage to the input of the sawtooth current generator energizing vertical deflection coils.

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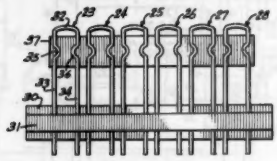
**3,586,903**

## SPARK GAP DEVICES

**Sylvester R. Taterzynski, and George Dand Raeburn, both of Milwaukee, Wis., assignors to Globe-Union Inc., Milwaukee, Wis.**

**Filed May 13, 1968, Ser. No. 728,497**
**Int. Cl. H01t** *1/16, 5/00*
**U.S. Cl. 315—35** **10 Claims**



Electrical devices and methods and apparatus for making the same, involving the support of conductive portions in an insulating member. Spark gap devices are constructed by moving heated rigid pressure members together to press kinked U-shaped wires into a strip of insulating material which is preferably a glass fiber mat preimpregnated with a semicured polyester. A second strip may be used with the wires being sandwiched between the strips which are pressed together by the pressure members to fuse them. The bight portions of the U-shaped wires are severed to provide spark gaps, preferably by use of severing means associated with the pressure members. By making a plurality of spark gap devices in strip form, grooves for automatic separation may be formed by providing projections on at least one of the pressure members.

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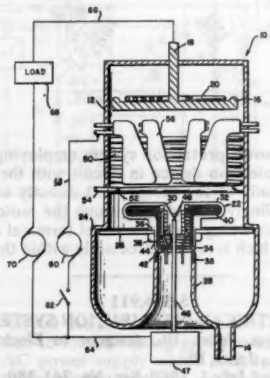
**3,586,904**

## OFF-SWITCHING OF LIQUID-METAL ARC SWITCHING DEVICE BY AUXILIARY ARC LIQUID-METAL STARVATION

**Wilfried O. Eckhardt, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.**

**Filed Apr. 21, 1969, Ser. No. 817,900**
**Int. Cl. H01j** *13/04*
**U.S. Cl. 315—111** **10 Claims**




An enclosed vessel containing one or more main anodes, one or more auxiliary anodes, a cathode, and means for maintaining a low pressure in the tube comprises a liquid-metal arc switching device. The cathode is fed with a metal which is liquid at convenient temperatures, so that limited quantities of the metal are present and available on the cathode for arcing. The interior of the vessel is maintained at a low background pressure so that during nonconduction, vacuum space insulation is provided between the anodes and the cathode. Arc initiation is accomplished by any convenient initiator, and the arc runs upon the small amount of liquid metal fed at an appropriate rate to the cathode. Arc extinction is accomplished by causing current to flow from the cathode to the auxiliary anodes at rates substantially higher than the main anode current. This causes consumption of the liquid metal at a higher rate than the liquid-metal feed rate, with consequent arc extinction by cathode starvation.

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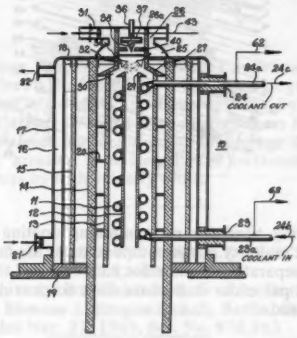
**3,586,905**

## PLASMA ARC HEATING APPARATUS

**Rodolphe Bignell, Varennes, Quebec, Canada, assignor to Canadian Titanium Pigments Limited, Montreal, Quebec, Canada**

**Filed June 3, 1969, Ser. No. 829,923**
**Int. Cl. H01j** *7/24*
**U.S. Cl. 315—111** **9 Claims**




Plasma arc gas heating apparatus comprising in combination: a helically wound high frequency induction coil, means coaxially mounting said coil in a tubular enclosure open at one end for exit of heated gas and closed at the opposite end, a pair of spaced electrodes mounted in said closed end of said tubular enclosure, means for injecting a flow of gas therein between said electrodes and thence through and over said coil, additional means for injecting gas into said tubular enclosure at a point between said electrodes and said coil, and electrical connections to said electrodes for impressing a gas ionizing voltage therebetween.

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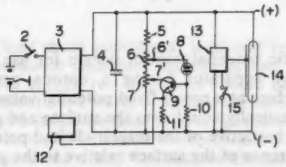
**3,586,906**

## CONTROL CIRCUIT FOR PHOTOFLASH DISCHARGE LAMPS

**Keno Okuno, Kawasaki-shi; Kouichi Takahata, Tokyo, and Takeshi Suda, Tokyo, all of, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Feb. 7, 1969, Ser. No. 797,625**
**Claims priority, application Japan, Feb. 23, 1968, 43/13386**
**Int. Cl. H05b** *37/00, 39/00*
**U.S. Cl. 315—241** **4 Claims**




Photoflash discharge lamps are controlled by a circuit which employs a glow tube operable in connection with the

terminal voltage of a condenser, which stores energy from a source of voltage. The voltage source is interruptable by an intermittent current due to the flashing of the glow tube. A monitor circuit is provided which is driven by the discharge current of the glow tube to negatively control the terminal voltage of the glow tube and control the ratio of the voltage at the beginning of discharge to the voltage at the termination of discharge. As a result, the terminal voltage of the condenser is maintained substantially constant.

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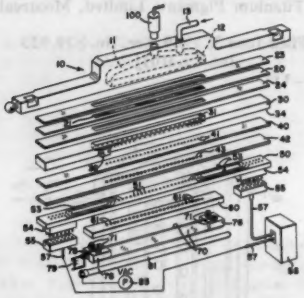
**3,586,907**
**LAMINATED COATING HEAD**

**Dale R. Beam, and Russell H. Van Brimer, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio**

**Filed Nov. 17, 1969, Ser. No. 877,250**
**Int. Cl. G01d** *15/18*; **B05b** *5/00, 5/02*
**U.S. Cl. 317—3** **14 Claims**



A coating head for noncontacting coating apparatus in which the majority of the components of the head are manufactured separately as platelike members and then assembled in the proper order in laminar form to provide a laminated coating head.

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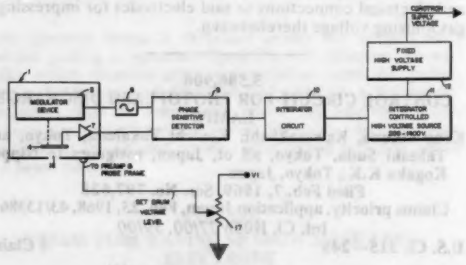
**3,586,908**
**AUTOMATIC POTENTIAL CONTROL SYSTEM FOR ELECTROPHOTOGRAPHY APPARATUS**

**Robert E. Vosteen, 315 W. Center St., Median, N.Y. 14103**

**Filed Feb. 28, 1969, Ser. No. 803,350**
**Int. Cl. G03g** *15/02*
**U.S. Cl. 317—4** **17 Claims**



An automatic potential control system for use with electrophotography apparatus having a corona generator to maintain a surface at a preset fixed potential value. A detector is electrostatically coupled to the surface and produces a control signal indicative of the magnitude and polarity of the potential difference of the surface relative to the preset fixed potential. Integrator means are connected to the output of the detector and control a high voltage supply to supply a corresponding input voltage to the corona generator to cause the latter to charge the surface to the preset fixed potential value.

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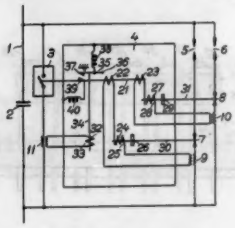
**3,586,909**
**PROTECTING MEANS FOR SERIES CAPACITORS IN HIGH VOLTAGE ELECTRICAL CONDUCTORS**

**Thor Erik Thorsteinsen, and Valter Larsson, both of Vasteras, Sweden, assignors to Allmanna Svenska Elekriska Aktiebolaget, Vasteras, Sweden**

**Continuation-in-part of application Ser. No. 781,344, Dec. 5, 1968. This application Apr. 28, 1969, Ser. No. 819,780**
**Int. Cl. H02h** *7/16*
**U.S. Cl. 317—12** **6 Claims**



For protecting series capacitors in high voltage electrical conductors, two circuits are provided in parallel with the capacitor, each containing a spark gap and a switch. A third switch constituted by a breaker can short circuit the capacitor. A control device is provided which, when one of the spark gaps ignites, closes the breaker, and thereafter opens the switch in the circuit of the ignited spark gap. When the fault ceases, the breaker opens and, shortly thereafter, the opened switch is reclosed.

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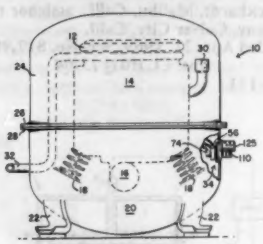
**3,586,910**
**INTERNAL HERMETIC MOTOR PROTECTION SYSTEM**

**Rudolph Stuart Sauber, Greenville, Mich., assignor to White Consolidated Industries, Inc., Greenville, Mich.**

**Filed May 19, 1969, Ser. No. 825,615**
**Int. Cl. H02h** *7/08*
**U.S. Cl. 317—13** **3 Claims**



A hermetic motor protection system employing a current-temperature protection device in circuit with the motor and mounted internally of the motor shell directly on fixed terminal plugs sealingly extending through the motor shell, the protection device being part of a novel terminal and protection assembly which is readily accessible within the shell.

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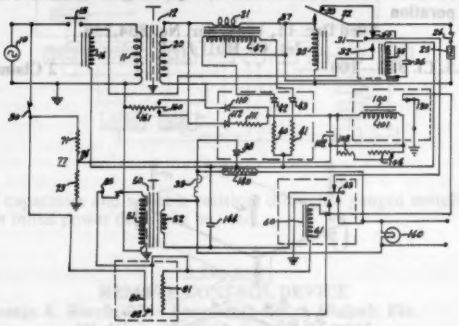
**3,586,911**
**ELECTRICAL DISTRIBUTION SYSTEM**

**Arthur A. Kraus, Joliet, Ill., assignor to Electronic Safety Controls, Inc., Joliet, Ill.**

**Filed July 1, 1968, Ser. No. 741,380**
**Int. Cl. H02h** *3/16*
**U.S. Cl. 317—18** **9 Claims**

An electrical distribution system is described wherein a grounded source supplies power to an ungrounded load

through an isolation transformer with an ungrounded secondary. To prevent unnecessary loading by the isolation transformer primary during no-load conditions, the electrical source is connected to the isolation transformer primary only in the presence of a load. The circuit includes a ground sensing network which operates to disable the power source in the event the secondary circuit becomes grounded thereby



creating a potentially hazardous condition. To prevent temporary ground conditions from permanently disabling the system, the circuit acts to automatically reset for a predetermined number of cycles after a ground condition is sensed. If the ground condition remains after the plurality of recyclings, then the system must be reset by hand after the grounded condition is remedied.

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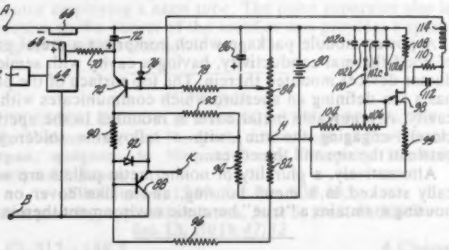
**3,586,912**

**ELECTRICAL DISCHARGE MACHINING POWER SUPPLY CIRCUIT WITH PHASE CONTROL FOR GAP SHORT CIRCUIT PROTECTION**

**Kurt H. Sennowitz, Royal Oak, Mich., assignor to Elox Inc., Troy, Mich.**

**Filed Feb. 20, 1970, Ser. No. 12,906**
**Int. Cl. B23k 9/10**
**U.S. Cl. 317—31** **9 Claims**



An EDM circuit includes a pulsed power supply periodically connected to the machining gap. The supply includes a multiphase AC power supply which includes a plurality of semiconductor controlled rectifiers, each coupled between a different phase and the gap for successive firing to provide controllable current to the gap. A control system interrupts firing of all semicontrolled rectifiers responsive to the sensing of gap short condition.

**3,586,913**

**HIGH VOLTAGE LIGHTNING ARRESTER HAVING A DISCHARGE SURGE COUNTING DEVICE MOUNTED ON ITS TOP TERMINAL BY INSULATING MEANS**

**Arthur A. Olsen, Pittsfield, Mass., assignor to General Electric Company**

**Filed Jan. 26, 1970, Ser. No. 5,752**
**Int. Cl. H02h 9/06**
**U.S. Cl. 317—61** **8 Claims**

A high voltage lightning arrester having a vertical height in excess of 20 feet is provided with a discharge surge counting device mounted adjacent its uppermost terminal by insulating members that are so arranged as to prevent them from being subjected to stresses that could break or damage them when the lightning arrester is subjected to horizontal torque-producing forces by high velocity winds.

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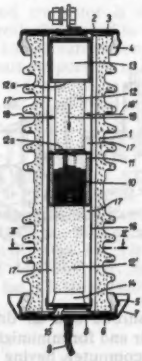
**3,586,914**

**OVERLOAD SHUNT WITH SINGLE RESISTOR ELEMENT**

**Rudolf Foltzik, and Klaus Reichelt, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany**

**Filed Nov. 21, 1969, Ser. No. 878,863**
**Claims priority, application Germany, Nov. 26, 1968, P 18 12 253.7**
**Int. Cl. H02h 1/04; H01c 15/04**
**U.S. Cl. 317—68** **10 Claims**



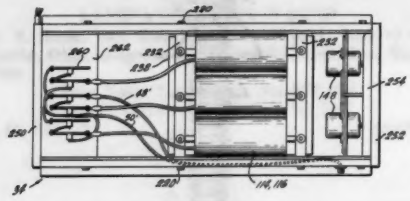
An overload shunt includes at least one resistor element having a nonlinear resistance and comprising material compressed from at least two directions toward each other. The resistor element has a width formed in the directions of compression and a length parallel to its longitudinal axis and perpendicular to the directions of compression. The length is at least as great as the width. The resistor element is positioned in a manner whereby current in the overload shunt flows along the length of the resistor element perpendicularly to the directions of compression.

3,586,915

## MODULAR ALTERNATING TO DIRECT CURRENT CONVERTER WITH EXTRUDED CORNER HOUSING PORTIONS

Thomas N. Urquhart, Troy; Micheal A. Koltuniak, Warren and Robert G. Plantholt, Rochester, all of, Mich., assignors to Controlled Power Corporation, Farmington, Mich.

Filed Feb. 6, 1970, Ser. No. 9,294
Int. Cl. H02b 1/18
U.S. Cl. 317—100 15 Claims



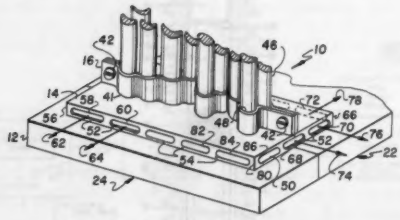
A modular power supply for converting three-phase alternating to direct current for high power applications. A plurality of individual rectifying modules are all fed through a common three-phase SCR controller. Each module in turn comprises its own transformer and rectifying circuit and has associated therewith an individual circuit breaker and cooling fan. The DC output from each module is collected by a common bussing arrangement and a particular automatic voltage-current regulator is provided to control the duty cycle of the common SCR controller. The current feedback includes a plurality of resistors that are selectively connected in the feedback circuit according to the number of modules in the power supply so that effective regulation is achieved regardless of the number of modules included. The module packaging is substantially the same with both modules used for high voltage, low current applications and for low voltage, high current applications. The construction of the modules is such as to facilitate interchangeability of many of the parts between the high voltage and low voltage module.

3,586,916

## COMPUTER CABLE SHROUD AND AIR DIFFUSER

George Bell, 420 Fairview Ave., Fort Lee, N.J. 07024

Filed May 27, 1969, Ser. No. 828,282
Int. Cl. H01b 7/34
U.S. Cl. 317—100 3 Claims



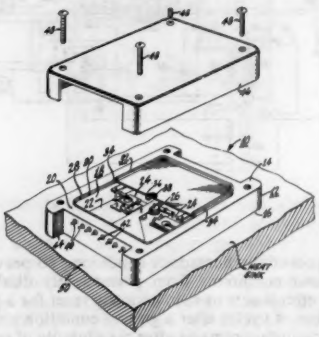
A computer cable shroud and air diffuser for efficiently utilizing conditioned air and for minimizing the loss of air circulation directed to a computer, having a square lower floor section or air diffuser tile juxtaposed to a plurality of floor tiles forming a floor slab or platform on which a computer is supported and at which location underfloor conditioned air is supplied. The shroud and air diffuser includes a rectangular upper section or air supply collar having openings enclosed by removable tabs whereby the unit is versatile in that a number of these tabs may be removed to direct conditioned air to desired predetermined locations of the computer and further including a plastic ribbon shroud for encircling cables directed from under the platform through the shroud and air diffuser to the computer which ribbon shroud is of a material which is pliable to take the configuration of the cables and can be hardened in said configuration and further being of the same material as the rectangular upper section of the diffuser for plastic bond to said upper section thereby preventing escape of conditioned air to undesirable locations of the computer to prevent waste of the conditioned air.

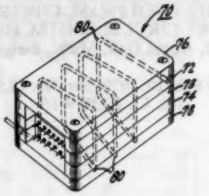
3,586,917

## SEMICONDUCTOR HYBRID POWER MODULE PACKAGE

William Lee Oates, Bernardsville, N.J., assignor to RCA Corporation

Filed Dec. 11, 1969, Ser. No. 884,258
Int. Cl. H01l 1/16
U.S. Cl. 317—100 2 Claims





A power module package which comprises a metal pallet of good thermal conductivity, having a cavity with semiconductor devices mounted therein. The top surface of the pallet has a rim defining an aperture which communicates with the cavity. A removable metal cover is mounted in the aperture closely engaging the rim, with a reflowable solder joint between the rim and the cover.

Alternatively, a plurality of nonhermetic pallets are vertically stacked in a metal housing, and a like cover on the housing maintains a "true" hermetic environment therein.

3,586,918

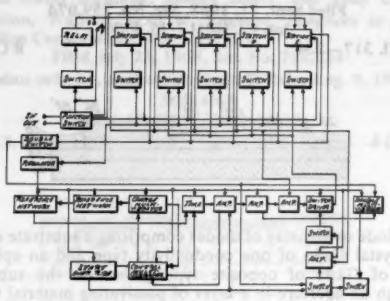
## PROGRAMMABLE INTERVALOMETER

Homer F. Roland, Shalimar, Fla., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Sept. 23, 1969, Ser. No. 860,282
Int. Cl. H01l 47/14
U.S. Cl. 317—139 3 Claims

A series of relay release stations which, when activated, connect power for launching. Activation is controlled by transistor switches, all but the first requiring a pulse from a switch driver and all but the first and second having clamping

circuits to prevent activation until a voltage is impressed from the preceding relay. Timing is controlled by a selection



of capacitors and variable resistors through a ganged switch. An initial power delay can be used.

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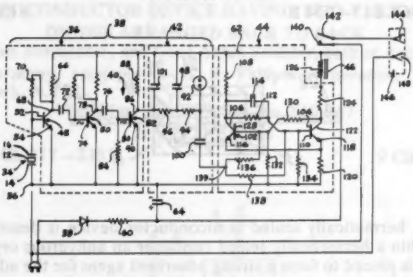
3,586,919

## REMOTE CONTROL DEVICE

George A. Harris, 7764 Fourteenth Court, Hialeah, Fla.

Filed Aug. 30, 1967, Ser. No. 664,445
Int. Cl. H01h 47/20
U.S. Cl. 317—147 3 Claims



This application is directed to a remotely actuated switch which utilizes an actuable and deactuable ultrasonic transmitter, and an ultrasonic receiver remote from the transmitter. The ultrasonic receiver has an ultrasonic detector, amplifier, rectifier, and a bistable flip-flop for controlling a relay. The bistable flip-flop is itself controlled by a pulse generator employing a neon tube. The pulse generator also is responsive to the output of the rectifier and provides a spurious signal rejection function.

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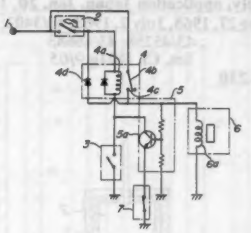
3,586,920

## AUTOMOBILE CLUTCH DISENGAGING APPARATUS

Hisato Wakamatsu, and Noriyoshi Ando, both of Kariya-shi, Japan, assignors to Nippon Denso Company Limited, Kariya-shi, Japan

Filed June 4, 1969, Ser. No. 830,403
Claims priority, application Japan, June 6, 1968, 43/38877
Int. Cl. H01h 47/32
U.S. Cl. 317—148.5 6 Claims

An automobile clutch disengaging apparatus comprising a first switch means adapted to be opened and closed in accordance with a lubricating oil pressure in the engine, a brake switch adapted to be opened and closed by the operation of a brake means, a second switch means adapted to be operated upon closure of said brake switch and said first switch means to permit power supply to a clutch disengaging solenoid, a holding circuit adapted to be operated upon closure of said second switch means to hold the latter in the closed state, and a third switch means for forcibly stopping the operation of said holding circuit, said second switch means including a self-holding circuit which is established by the fact that a current is caused to flow through said clutch disengaging solenoid. With this apparatus, the clutch is disengaged to cut off the connection between the wheels and the engine of a vehicle immediately when the engine is stopped as a result of the fact that the wheels are stopped from rotating when the vehicle is braked, so that the vehicle can be



prevented from skidding while the wheels are stopped from rotating, by facilitating the rotation of the wheels when the brake force imparted to the vehicle is removed even in the case where the vehicle is running on a road such as frozen snow-covered one the surface of which represents a low coefficient of friction with respect to the wheels.

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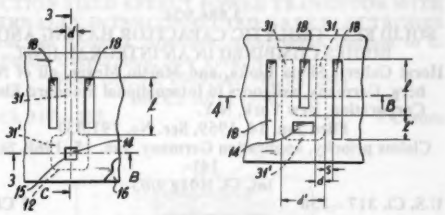
3,586,921

## HIGH SPEED DIFFUSION-TYPE TRANSISTOR

Hiroshi Shiba, and Toshio Kurosawa, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Minato-ku, Tokyo, Japan

Filed Jan. 16, 1969, Ser. No. 791,714
Claims priority, application Japan, Jan. 19, 1968, 43/3184
Int. Cl. H01l 5/02, 9/12
U.S. Cl. 317—235 R 5 Claims



A diffusion formed transistor is described wherein the emitter region is selectively shaped to provide on the surface in common with the base a narrow longitudinal portion and a wide portion. The narrow portion is sized to impart a high turn on switching speed capability to the transistor and the wide portion is sized for attachment to an electrode lead.

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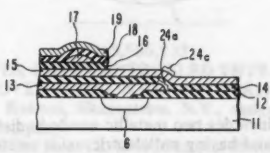
3,586,922

## MULTIPLE-LAYER METAL STRUCTURE AND PROCESSING

Larry R. Johnson, Sunnyvale, and Robert M. Whelton, Mountain View, both of, Calif., assignors to Fairchild Camera and Instrument Corporation, Mt. View, Calif.

Filed Oct. 31, 1969, Ser. No. 874,535
Int. Cl. H01l 19/00
U.S. Cl. 317—235 24 Claims



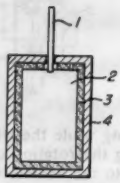
The metal conductors used on an integrated circuit containing multiple layers of metallization, are all produced with sloped sides and rounded edges by use of a special etchant, a mixture of phosphoric, nitric and acetic acids.

3,586,923

## ELECTROLYTIC CAPACITOR AND METHOD FOR MANUFACTURING SOLID ELECTROLYTE

Susumu Yoshimura, Kawasaki-shi, and Katsue Hasegawa, Tokyo, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 13, 1969, Ser. No. 790,664
Claims priority, application Japan, Jan. 20, 1968, June 27, 1968, June 27, 1968, July 2, 1968, 43/3402; 43/45257; 43/45258; 43/46683
Int. Cl. H01g 9/05
U.S. Cl. 317—230 4 Claims



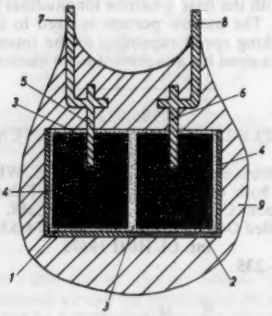

A solid electrolytic capacitor with a charge transfer complex disposed in place of the usual electrolyte (paste or manganese dioxide), the acceptor being an organic substance having oxidizing property against aluminum, tantalum etc. and the donor being selected so as to decrease the resistivity of the complex compound as much as possible; the characteristic being that through the use of the organic semiconductor electrolyte the self-healing of oxide film is made possible.

3,586,924

## SOLID ELECTROLYTIC CAPACITOR HAVING ANODE BODIES COMBINED IN AN INTEGRAL UNIT

Horst Gebert; Silvia Lipka, and Martin Meyer, all of Nurnberg, Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 14, 1969, Ser. No. 791,037
Claims priority, application Germany, Jan. 15, 1968, St 22 141
Int. Cl. H01g 9/05
U.S. Cl. 317—230 7 Claims



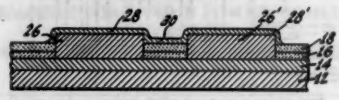

A capacitor includes two metallic anode bodies positioned close together and having a dielectric oxide coating thereon, a layer of semiconducting material over the oxide coating and a conducting layer over the semiconducting material, the semiconducting layer being between the bodies and the conducting layer at least partially surrounding the bodies to form an integral structure.

3,586,925

## GALLIUM ARSENIDE DIODES AND ARRAY OF DIODES

Jacques R. Collard, Trenton, N.J., assignor to RCA Corporation

Filed Sept. 11, 1968, Ser. No. 759,074
Int. Cl. H01l 7/36, 9/00
U.S. Cl. 317—234 8 Claims



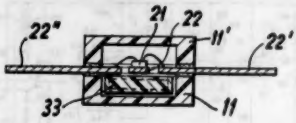

A diode or an array of diodes comprising a substrate of single crystal GaAs of one conductivity type and an epitaxial layer of GaAs of opposite type grown on the substrate through an aperture in a layer of passivating material where the aperture is octagonal in shape and having its sides oriented in the 100 and 110 crystallographic planes of the substrate material.

3,586,926

## HERMETICALLY SEALED SEMICONDUCTOR DEVICE WITH ABSORPTIVE AGENT

Yoshiaki Nakamura, and Kazuhiko Yoshikawa, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Nov. 27, 1968, Ser. No. 779,509
Claims priority, application Japan, Nov. 30, 1967, 42/77134
Int. Cl. H01l 1/10
U.S. Cl. 317—234 R 3 Claims



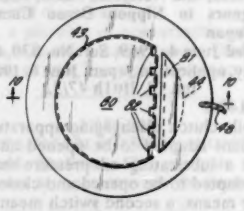

A hermetically sealed semiconductor device is described. Within a hermetically sealed container an anhydrous organic salt is placed to form a strong adsorbent agent for the adsorption of water and other undesired substances. Copper sulfate is a preferred organic salt from which the water of crystallization has been removed before the sealing of the container.

3,586,927

## CONTROLLED RECTIFIER HAVING AUXILIARY CATHODE AND SLOTTED MAIN CATHODE

Thomas J. Roach, Palos Verdes Estates, and James H. Hauck, Torrance, both of, Calif., assignors to International Rectifier Corporation, Los Angeles, Calif.

Filed July 16, 1969, Ser. No. 842,096
Int. Cl. H01l 11/10
U.S. Cl. 317—235 R 4 Claims



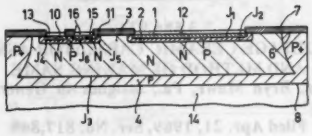

The main cathode of a controlled electrode is slotted with at least five teeth, each of which extend across the main emitter junction and adjacent an auxiliary cathode. The regions between the teeth on the main cathode serve the effect of a plurality of local points for carrier injection.

3,586,928

## INTEGRATED TRANSVERSE AND TRIGGERING LATERAL THYRISTORS

Gerald David Bergman, Bushey Heath, and Tony Charles Denton, Watford, both of, England, assignors to U. S. Philips Corporation, New York, N.Y.

Filed July 25, 1968, Ser. No. 754,134
Claims priority, application Great Britain, Aug. 9, 1967, 36514/67
Int. Cl. H011 *19/00, 11/10*
U.S. Cl. 317—235R 4 Claims



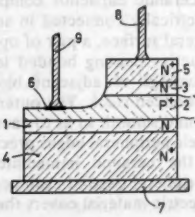
An integrated switching system is described comprising transverse and lateral thyristors, the latter being connected to trigger or turn on the transverse thyristor. Both thyristors are made in the same wafer by a planar process, the additional lateral thyristor being made simultaneously with regions of the transverse thyristor thereby minimizing additional processing steps.

3,586,929

## SEMICONDUCTOR DEVICE HAVING TWO VARICAP DIODES ARRANGED BACK TO BACK

Jurgen Burmeister, and Gerd Anton Schiefer, both of Aachen, Germany, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1969, Ser. No. 810,947
Int. Cl. H011 *5/00*
U.S. Cl. 317—235 9 Claims



Two varicap diodes are integrated into a common semiconductor body by preferably epitaxial techniques. The structure comprises a middle region of high conductivity flanked on two sides by opposite type regions of lower conductivity, in turn flanked by contact regions of high conductivity. Connections are made to the middle region and the contact regions.

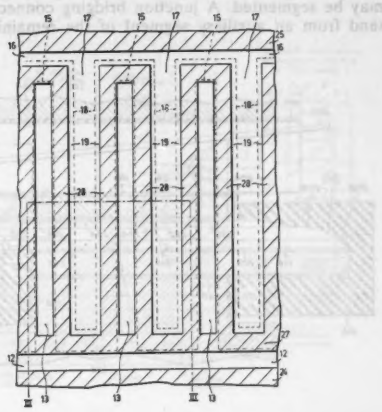
3,586,930

## HIGH FREQUENCY, HIGH POWER IGFET WITH INTERDIGITAL ELECTRODES AND PLURAL LOOPED GATE

Mukunda Behari Das, Thornton Heath, and Richard Downing Josephy, Ham, Richmond, both of, England, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Mar. 10, 1969, Ser. No. 805,396
Claims priority, application Great Britain, Mar. 11, 1968, 11844/68
Int. Cl. H011 *11/14*
U.S. Cl. 317—235 R 12 Claims

This invention relates to insulated field effect transistors, particularly to insulated gate field effect transistors, suitable for high frequency, high power operation, in which the source and drain regions each comprise a base part and a plurality of finger parts extending therefrom, the source finger parts being interdigitated with the drain finger parts and the current carrying channel region being situated at surface region parts between adjacent source finger parts and drain finger parts, the gate electrode comprising a metal layer pattern having a plurality of limb portions situated above said surface region parts and extending substantially parallel to the longitudinal direction of the source and drain finger parts.

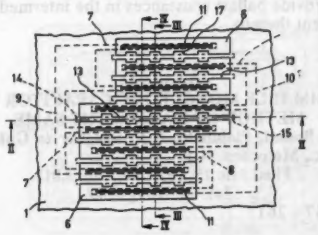


3,586,931

## JUNCTION FIELD EFFECT POWER TRANSISTOR WITH INTERNALLY INTERCONNECTED GATE ELECTRODES

Rijkent Jan Nienhuis, Nijmegen, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Oct. 13, 1969, Ser. No. 865,581
Int. Cl. H011 *1/14*
U.S. Cl. 317—235 7 Claims



A junction field effect transistor adapted for power applications is described. It comprises interdigital source and drain contacts and a surface gate electrode connected at its ends to a substrate gate. To reduce the gate resistance, plural zones are provided which extend through the channel interconnecting the surface gate with the substrate gate regions. The interconnecting zones may be in the form of columns or strips.

3,586,932

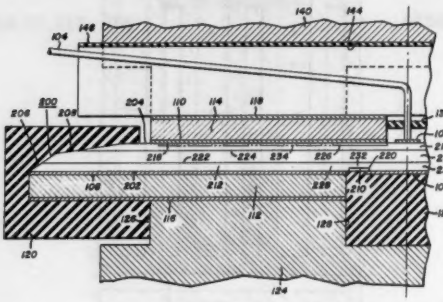
## FIVE LAYER GATE CONTROLLED THYRISTOR WITH NOVEL TURN ON CHARACTERISTICS

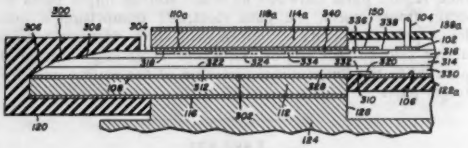
Richard A. Kokosa, Skaneateles, N.Y., assignor to General Electric Company

Filed Dec. 12, 1969, Ser. No. 884,659
Int. Cl. H011 *19/00*
U.S. Cl. 317—235 R 24 Claims

A semiconductive element is provided having five successive layers of alternating conductivity type in which a first endmost layer is interposed between a main zone and an aux-

iliary zone of an adjacent intermediate layer. A junction bridging conductor extends from the auxiliary zone to an adjacent edge of the endmost layer while the remaining edge of the endmost layer is located in lateral proximity to the main zone. Ohmic contacts are associated with the main zone and a remaining endmost layer. The remaining endmost layer may be segmented. A junction bridging connector may extend from an auxiliary segment of the remaining endmost





layer toward a remaining segment thereof at a location which overlies the edge of the main zone associated with the first endmost layer. The first endmost layer and the conductor associated therewith may be distributed to lie adjacent opposed peripheries of the main zone, and the auxiliary segment and its associated conductor may be similarly distributed. The auxiliary segment and the first endmost layer may be also divided to provide ballast resistances in the intermediate layers next adjacent thereto.

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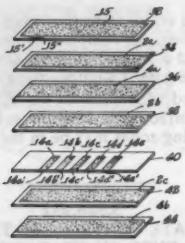
**3,586,933**

**TRIMMABLE MONOLITHIC CAPACITOR AND METHOD OF MAKING THE SAME**

**Joseph N. Bonini, Plainfield, N.J., assignor to Gulton Industries, Inc., Metuchen, N.J.**

**Filed Jan. 15, 1970, Ser. No. 3,011**
**Int. Cl. H01g** *3/09*
**U.S. Cl. 317—261** **8 Claims**



A trimmable capacitor is formed of a monolithic capacitor body made of a plurality of peripherally fired together layers of insulating material each coated with a conductive material forming a capacitor plate. Preferably, at least one rough trimming adjustment plate is formed by a conductive coating on one of the layers of insulating material and opposite a main plate-forming conductive coating of an adjacent layer of insulating material. Also, a plurality of fine trimming adjustment plate means are formed by spaced-apart conductive coatings on another layer of insulating material opposite a second plate-forming conductive coating on an adjacent layer of insulating material. The rough trimming plate means and each of the fine trimming plate means have edge portions extending to one side of the capacitor body and are selectively connected in circuit with one group of the main capacitor-forming plates incrementally to increase the capacitance value thereof to a desired fixed capacitance value.

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**3,586,934**

**HIGH VOLTAGE CERAMIC CAPACITOR ASSEMBLY AND METHOD OF MAKING SAME**

**Roy Nakata, Bryn Mawr, Pa., assignor to General Electric Company**

**Filed Apr. 21, 1969, Ser. No. 817,848**
**Int. Cl. H01g** *3/06*
**U.S. Cl. 317—261** **16 Claims**

A high voltage ceramic capacitor comprising a stack of ceramic blocks electrically connected in series. Each block has an outer peripheral surface, a pair of opposed planar end faces, and a conductive coating bonded to each end face. The juxtaposed coatings of adjacent blocks are bonded together to form a bonded stack. The outer periphery of the bonded stack is ground smooth so as to cause the conductive coatings to have their peripheral edges precisely aligned with the periphery of the ceramic immediately thereadjacent about the entire peripheral edge of each conductive coating. A thin layer of dielectric material covers the periphery of the stack.

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**ERRATUM**

For Class 317—674 see:
Patent No. 3,586,952

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**3,586,935**

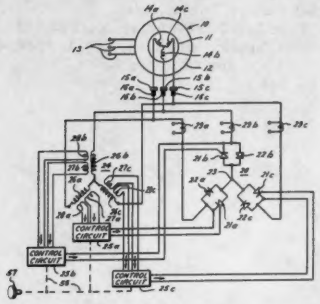
**SPEED REGULATING AND CONTROL SYSTEM FOR PLURAL-PHASE-WOUND-ROTOR INDUCTION MOTORS**

**Oscar E. Lundelius, Sr., 3026 Underwood, Houston, Tex., and John G. Tittle, Sr., 217 Queens Road, Pasadena, Tex.**

**Filed Jan. 9, 1969, Ser. No. 790,046**
**Int. Cl. H02k** *17/34*
**U.S. Cl. 318—49** **6 Claims**

A motor control system for controlling the speed of a three-phase wound-rotor induction-type electric motor. Silicon controlled rectifiers are connected in circuit with the rotor windings of the motor for controlling the current flow therein. A control circuit is connected to the gate electrode of each of the silicon controlled rectifiers for firing same. These control circuits are responsive to the rotor winding voltages for determining the phase angles at which the silicon controlled rectifiers are fired. This control action acts to hold

the motor speed constant under varying load conditions. Adjustable bias circuit means are connected to each of the con-



trol circuits for changing the basic operating speed of the motor.

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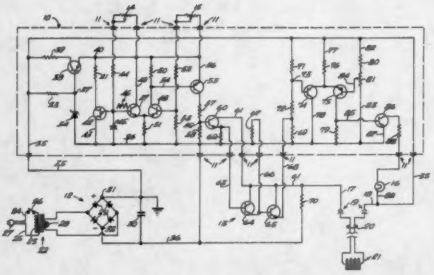
3,586,936

## VISUAL TUNING ELECTRONIC DRIVE CIRCUITRY FOR ULTRASONIC DENTAL TOOLS

Robert P. McLeroy, Miramar, Fla., assignor to C & B Corporation

Filed Oct. 16, 1969, Ser. No. 866,984
Int. Cl. H01v 9/00
U.S. Cl. 318—118 6 Claims



Solid state electronic circuitry for driving the magnetostrictive transducer of ultrasonic dental tools is described, wherein tuning to resonance is controlled by circuit adjustment to maximum brightness of a tuning indicator lamp. Variation of brightness of the lamp as a function of tuning accuracy is achieved by feeding a reference voltage proportional to the excitation current flowing through the ultrasonic transducer to the input of a differential amplifier stage to compare it with a preset reference voltage. The varying output voltage thus derived is amplified to provide an energization current for the indicator lamp which will be proportional to the transducer excitation current and thus an indication of tuning to resonance.

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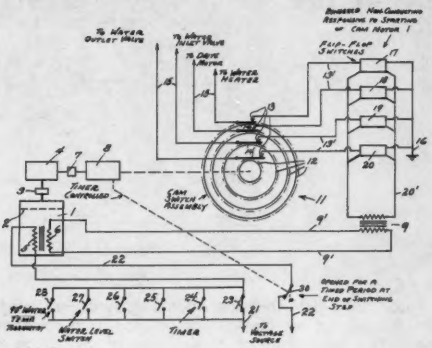
3,586,937

## PROGRAMMED SWITCHING DEVICE INCLUDING SPARK PREVENTION

Walter U. Holzer, Meersburg Eodensee, Schutzenrain, Germany

Continuation-in-part of application Ser. No. 775,271, Nov. 13, 1968, now abandoned. This application Dec. 9, 1969, Ser. No. 883,393
Int. Cl. H02k 37/00
U.S. Cl. 318—138 10 Claims

A switching device controlling the various load circuits of a washing machine. The load circuits are controlled by respective electronic switches, which are in turn controlled by mechanical switches operated by cams on a cam disc assembly driven by a stepping motor. The stepping motor is controlled by respective command switches responding to different conditions in the washing machine, such as water temperature, water level, etc. The stepping motor has a



secondary winding which transmits control signals through a pulse transformer to the electronic switches. The electronic switches are made conductive when the stepping motor is turned off and are made nonconductive when the stepping motor is turned on.

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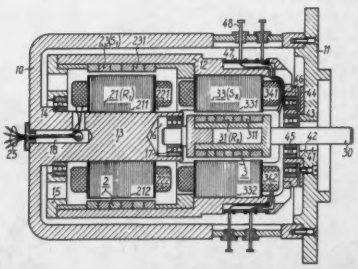
3,586,938

## PHASE-SENSITIVE SERVOMOTOR

Jean-Claude Le Gall, Rue des Bruyeres La Clarte-Ploumanach, Perros-Guirec, France

Filed Apr. 27, 1970, Ser. No. 032,182
Claims priority, application France, Apr. 28, 1969, 6913446
Int. Cl. H02k 7/20
U.S. Cl. 318—166 8 Claims



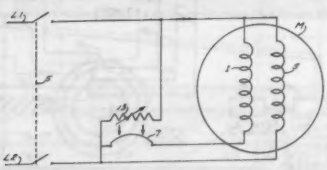
AC energized servomotor having an angular response which is proportional to the phase of an input one-phase signal referred to the AC one-phase supply current. This servomotor includes two *p*-phase synchronous motors each comprising a first member bearing field windings and a second member bearing a magnetic armature cooperating with the field windings, one of the first and second members of one motor being held stationary and the other member being rotatable and both the first and second members of the other motor being rotatable. Means are provided for coupling together the rotatable member of the said one motor and either of the first and second members of the said other motor, and for deriving from the input one-phase signal an input *p*-phase signal and from the one-phase supply current a *p*-phase supply current. The field windings of the said one motor are energized by the p-phase supply current and the field windings of the said other motor by the servomotor input *p*-phase signal, so that the member of the said other motor which is not coupled to the rotatable member of the said one motor takes up an angular position proportional to the phase of the input one-phase signal.

3,586,939

## ELECTROTHERMAL MOTOR STARTING APPARATUS

Francis P. Buiting, Plainville, and Lyle E. McBride, Jr., Norton, both of, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 7, 1968, Ser. No. 735,377
Int. Cl. H02p 1/44
U.S. Cl. 318—221 E 9 Claims



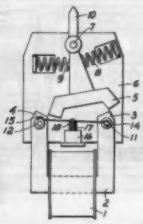
Apparatus is described for automatically deenergizing the start winding of an electric motor after a predetermined delay. The start winding is deenergized by a thermally responsive switching means to which heat is applied by a PTC thermistor operated in a self-heating mode. The PTC characteristic of the thermistor limits heating after the motor is started. The thermally responsive current switching means may include a snap-acting thermostatic switch or a semiconductor current switching device controlled by another thermistor.

3,586,940

## APPARATUS WITH AN ELECTRICAL DRIVING MOTOR

Jens Benirschke, Klagenfurt, Austria, assignor to Firma Carinthia Elektrogerate Gesellschaft m.b.H., Kalgenfurt, (Karnter), Austria

Filed June 17, 1969, Ser. No. 833,962
Claims priority, application Austria, June 25, 1968, A6103/68
Int. Cl. H02k 17/30
U.S. Cl. 318—225 2 Claims



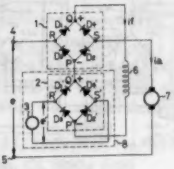
This invention provides electrically driven apparatus, such as electric razors, electric coffee grinders and the like, in which the electrical drive includes an electromagnetic stator having at least two poles, with a switch which automatically adjusts the exciter winding of the stator to take either one of two different mains voltage ranges according to the mains voltage to which the apparatus is connected. The switch has an actuating member which is pivotally mounted on one of said stator poles and which has a portion lying adjacent another stator pole which, in use, is of opposite polarity so that the member is attracted to it, and a spring which normally holds the member away from the second pole in a position in which the exciter winding is adjusted to take the lower voltage range, but which is overcome by the magnetic attraction of the second pole on the member as soon as, and only for as long as, the apparatus is connected to an electrical source within the higher voltage range, this causing the switch to be actuated to adjust the exciter winding to take the higher voltage range.

3,586,941

## COMPENSATING SYSTEM FOR A SERIES SERVOMOTOR

Tadao Fujimaki, Tokyo, Japan, assignor to Tokyo Electrical Engineering College, Tokyo, Japan

Filed July 23, 1969, Ser. No. 844,102
Claims priority, application Japan, Aug. 1, 1968, 43/54538
Int. Cl. H02p 7/14
U.S. Cl. 318—246 10 Claims



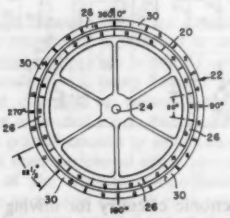
A compensating system for a series servomotor which improves various characteristics of the motor by causing same to operate as a separately excited motor when its control voltage is low and as a series motor when its control voltage is increased.

3,586,942

## SELF COMMUTATED MOTOR HAVING A 16—18 RATIO OF ARMATURE POLES TO ROTOR POLES

James E. McMahan, 340 West End Blvd., Winston-Salem, N.C. 27101

Filed Sept. 19, 1968, Ser. No. 753,355
Int. Cl. H02k 29/00
U.S. Cl. 318—254 7 Claims



A magnetic motor which includes a rotor, having a preselected number of polarized magnetic poles spaced about its periphery rotating with respect to an armature having a differing, preselected number of circumferentially spaced, magnetic poles, the motor utilizing at least four pole-polarity switching circuits responsive to the rotation of the rotor each of which circuits will selectively reverse the polarity of the armature poles to continue the rotation of the rotor with respect to the armature.

3,586,943

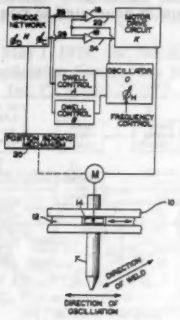
## TORCH OSCILLATING SYSTEM

Raymond Joseph Gonzalez, Rockaway, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 18, 1968, Ser. No. 760,450
Int. Cl. H02p 5/00
U.S. Cl. 318—257 8 Claims

A solid-state torch oscillating system for controllably reciprocating the torch about an adjustable reference position in a direction transverse to the direction of welding. The system includes a bridge network which provides a differential pulse output signal, the polarity of which is synchronized to the motor rotation for controlling the

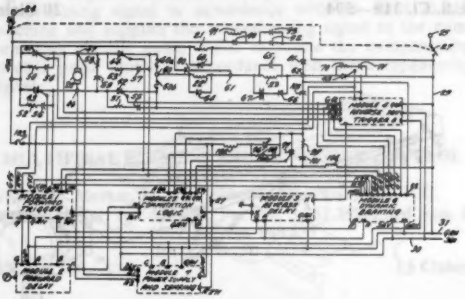
direction of a continuous sequence of drive pulses being applied to the motor and means responsive to the distance traversed by the torch for reversing the polarity of the bridge output signal.



## 3,586,944
## REVERSING CONTROLLER FOR DC MOTOR

David Cooper, Palos Verdes, and Frank W. Parrish, El Segundo, both of, Calif., assignors to International Rectifier Corporation, Los Angeles, Calif.

Filed Feb. 24, 1970, Ser. No. 13,313
Int. Cl. H02p *5/00*
U.S. Cl. 318—258 18 Claims



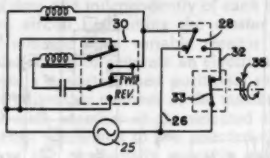
Controlled rectifiers are fired in selective groups in order to energize a DC motor for forward rotation, reverse rotation, motor stopping and motor stopping with dynamic braking. The control circuits for firing selected groups of controlled rectifiers are carried in respective modules, some of which are interchangeable and which provide electrical lockout for preventing energization of groups of controlled rectifiers until a particular sequence is completed. Forward and reverse operation of the motor and stopping of the motor are carried out with predetermined time delays.

## 3,586,945
## MULTISPEED SYNCHRONOUS MOTOR DRIVE

Kingston E. Ganske, and Jerry O. Kelley, both of Columbus, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.

Filed Feb. 14, 1968, Ser. No. 705,406
Int. Cl. H02p *5/08*
U.S. Cl. 318—305 4 Claims

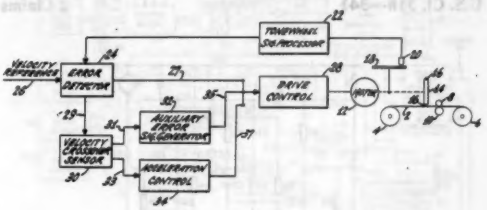
A synchronous hysteresis electric motor operates at its synchronous speed to drive a load such as the capstan in a magnetic recording system. A separate power supply circuit to the synchronous motor includes a motor speed sensitive feedback control such as a governor operated switch, which interrupts the power supply to the motor whenever the motor exceeds a predetermined speed lower than synchronous speed, and restores the power supply as soon as the motor slows beyond the lower speed.



## 3,586,946
## SERVOSYSTEM

Koichi Sadashige, Berlin, N.J., and Masaru Horii, Ooyamazaki-Cho, Japan, assignors to RCA Corporation

Filed Dec. 23, 1969, Ser. No. 887,617
Claims priority, application Great Britain, Mar. 21, 1969, 14945/69
Int. Cl. H02p *1/04*
U.S. Cl. 318—326 6 Claims



A servosystem is provided for achieving reference velocity of a drive means from a stall condition in a minimal time. Means responsive to velocity error detection cause rapid acceleration condition to be maintained to the drive means until the reference velocity is reached. At the moment of crossover of the reference velocity, a controlled variable auxiliary error signal is generated and applied to the drive means. This limits the amount and duration of velocity overshoot, to rapidly stabilize the drive means at the reference velocity.

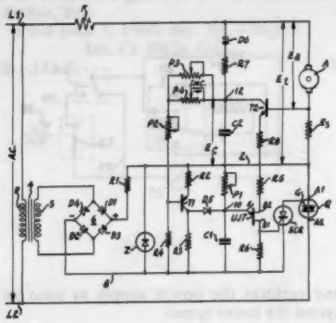
## 3,586,947
## FULL-WAVE ADJUSTABLE MOTOR SPEED CONTROL SYSTEM WITH FEEDBACK

Ronald J. Ilk, and Walter L. Rutchik, both of Milwaukee, Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 9, 1969, Ser. No. 814,590
Int. Cl. H02p *5/16*
U.S. Cl. 318—331 10 Claims

A full-wave adjustable motor speed control system with feedback for automatic regulation of the speed of an AC motor such as a series or universal motor. A bidirectional thyristor triode in series with the motor armature winding is controlled by a firing circuit operated by a ramp and pedestal voltage. The ramp may be set at a fixed value whereas the pedestal is adjusted for desired speed and regulated by a

feedback signal. This feedback signal is developed in an amplifying feedback circuit that is adjusted to eliminate unwanted characteristics and to provide a true speed signal proportional to motor counter EMF.



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**3,586,948**

**METHOD AND AN ARRANGEMENT OF CONTROLLING A DC MOTOR ON CONSTANT SPEED**

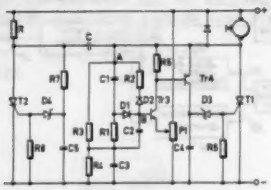
**John Ingmar Broome, Stralvagen 25, Sorberge; Bert Hjalmar Engman, Framnas C., Timra; Sven Nils Johannes Linnman, Stormastarvagen 15,, Liding 4, and Per E. C. Udden, Nygation 1,, Timra, all of, Sweden**

**Filed Oct. 25, 1968, Ser. No. 770,580**

**Claims priority, application Sweden, Nov. 3, 1967, 15136**

**Int. Cl. H02p** *5/16*

**U.S. Cl. 318—341** **2 Claims**



A speed control circuit, electrically in parallel with a controllable semiconductor, which is electrically in series with a DC motor, said control circuit including an RC circuit in which the capacitor, upon cutoff of said semiconductor, discharges through the resistor of said RC circuit with a discharge current which is proportional to the motor current just before cutoff until the voltage across the semiconductor has reached its stationary DC voltage value. The discharge current is caused to flow through the resistor of the RC circuit thereby causing a voltage drop, which is detected and stored in a capacitor. The difference between the maximum actual stored resistor voltage and a command voltage is applied to the controllable semiconductor means to govern the speed of the motor.

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**3,586,949**

**THREE-PHASE DC MOTOR CONTROL SYSTEM**

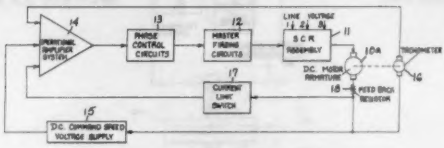
**Kenneth D. Spear, Southington, and Carles F. Raber, Simsbury, both of, Conn., assignors to Pratt and Whitney Inc., West Hartford, Conn.**

**Filed May 23, 1968, Ser. No. 731,420**

**Int. Cl. H02p** *5/00*

**U.S. Cl. 318—257** **4 Claims**

This invention is directed to a three-phase DC motor drive for use in conjunction with machine tools for driving a spindle or a slide. In particular, the invention comprises a silicon controlled rectifier (SCR) assembly, utilized to permit three-phase line voltages to be applied across the armature of a DC motor. A tachometer is utilized to generate a signal indicative of the motor speed which is combined with a command signal and a current limit signal. From the combination of these signals, a signal is generated to control the firing of the SCR assembly. This invention includes the use of saturable reactors to prevent one of the SCR's of the assembly from firing while another is conducting. Also as an important feature of this invention, there is provided tachometer ripple cancellation in order to obtain a low noise output signal from the tachometer.



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**3,586,950**

**INSTALLATION FOR PROGRAMMED CONTROL OF A MACHINE-TOOL**

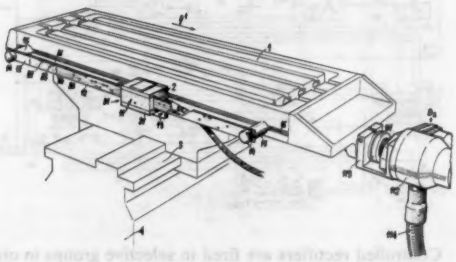
**Jacques Prodel, 13 rue Michelet, Rueil-Malmaison, Hauts-de-Seine 92, France**

**Filed Jan. 22, 1969, Ser. No. 793,092**

**Claims priority, application France, Jan. 23, 1968, 136,960**

**Int. Cl. G05b** *11/18, 1/06*

**U.S. Cl. 318—594** **20 Claims**

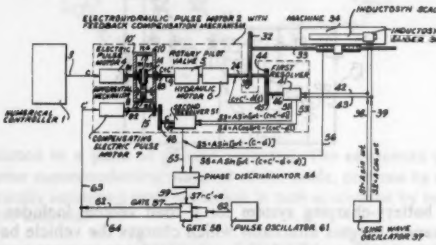


Installation for programmed control of a machine tool of the type comprising, for each carriage, a mechanism for controlling the drive linked to a motor and a system for controlling the supply to said motor, said installation including: means for the detection of approach having a relatively average accuracy of the order of 0.3 mm., by default, said approach detection means being capable of covering on their own the total extent of travel of the carriage; and means for the detection of stopping having a relatively high accuracy of the order of 0.02 mm.; and wherein said system for controlling the supply to said motor is connected through appropriate connecting means to selectively be commanded by said approach detection means, the information supplied by said approach detection means causing the supply of current to said motor to change so as to slow down said motor to a constant minimum speed and at the same time conditioning said connecting means so that said supply control system is put under the control of said stop detection means, the information supplied by said stop detection means subsequently causing cutting off of said supply to the motor in order to ensure the precise stopping of said carriage.

## 3,586,951
## NUMERICALLY CONTROLLED MACHINE SYSTEM DRIVEN BY ELECTROHYDRAULIC PULSE MOTOR

Seluemon Inaba, Kawasaki; Kanryo Shimizu, Kawasaki; Yoshihiro Hashimoto, Yokohama, and Hiroshi Usami, Kawasaki, all of, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 1, 1970, Ser. No. 33,670
Claims priority, application Japan, May 14, 1969, 44/37124
Int. Cl. G05d *23/275*
U.S. Cl. 318—632 5 Claims

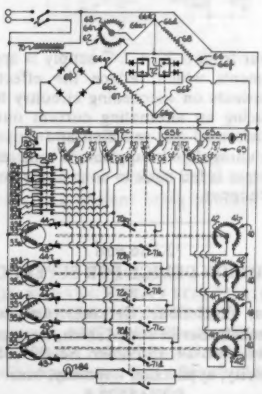



An electric pulse motor has an input electrically connected to a source of control signals and an output mechanically coupled to the input of a differential mechanism. A compensating electric pulse motor has an output mechanically coupled to the input of the differential mechanism. A rotary pilot valve is mechanically coupled to the output of the differential mechanism. A compensating circuit has an input electrically connected to a machine which is mechanically coupled to the valve and an output electrically connected to the compensating electric pulse motor. The compensating circuit derives a compensating signal in accordance with an error in the machine and supplies the compensating signal to the compensating electric pulse motor to rotate the compensating electric pulse motor in accordance with the compensating signal.

## 3,586,952
## MULTIFINAL ELEMENT SINGLE MASTER CONTROL SERVOSYSTEM

Grover C. Meetze, Jr., 104 Hillside Drive, Davidson, N.C.

Division of Ser. No. 595,399, Pat. No. 3,469,354. Filed Aug. 8, 1969, Ser. No. 848,533
Int. Cl. G05b *11/14*
U.S. Cl. 318—674 13 Claims

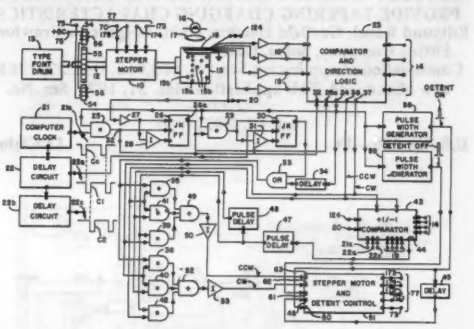


Servosystem for use with a plurality of movable accessories comprising a master variable resistor having a positionally adjustable member, a plurality of slave variable resistors each having a positionally movable member adapted to be operatively connected to a corresponding one of the accessories for movement therewith, selector means electrically connected to the master variable resistor and to each of the slave variable resistors for selectively electrically interconnecting the master variable resistor with each of the slave variable resistors one at a time and independently of each other, electrical comparison circuit connecting the master variable resistor and the selected slave variable resistor in resistance comparison relationship to generate an electrical signal upon a deviation from a predetermined positional relationship of the positionally adjustable member of the master resistor and positionally movable member of the selected slave resistor, and motive means connected to the selected slave variable resistor to move the positionally movable member of the selected slave variable resistor and any accessory connected thereto into predetermined correlated relationship with the positionally adjustable member of the master variable resistor.

## 3,586,953
## STEPPER MOTOR CONTROL SYSTEM

Carl O. Markkanen, Hasbrouck Heights, N.J.; Dale B. Blackwell, Huntington; George A. Knaust, Westbury; Christian R. Kropac, East Northport, and John M. McCall, Huntington, N.Y., assignors to Fairchild Camera and Instrument Corporation

Filed Sept. 22, 1967, Ser. No. 669,926
Int. Cl. G05b *19/40*
U.S. Cl. 318—685 10 Claims




A stepper motor drive system includes a shaft carrying an encoder which develops a binary-coded signal representative of 12 discrete shaft positions on either side of a reference position. Binary-coded signals representative of the desired position of the motor and the shaft position signals are applied to a digital comparator and direction logic circuit which develops output pulses until the motor advances to bring the shaft position signals and the input signals into coincidence. The comparator also develops CW or CCW signals indicating the direction of rotation of the motor in order to reach the desired position in the shortest direction. An electromagnetic detent on the motor shaft is controlled by the comparator to lock the motor shaft in the final desired position.

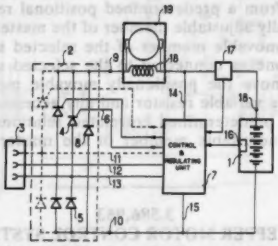
To prevent overshoot of the motor past a desired position *n* and subsequent oscillation about that position, an auxiliary comparator responsive to the shaft encoder signals and the input signals develops a simulated coincidence signal when the motor reaches the *n*−1 or *n*+1 position, depending upon whether it is rotating CW or CCW, respectively, and this latter signal is utilized to excite the motor momentarily in the reverse direction to check its momentum. Shortly before the motor reaches the final desired position, a forward direction pulse is applied to the motor to drive it to that position.

3,586,954

## EQUIPMENT FOR CHARGING ACCUMULATOR BATTERIES

Henri Carves, Paris, France, assignor to L'Eclairage Des Vehicules Sur Rail (E. V. R.),, Paris, France

Filed Nov. 8, 1968, Ser. No. 774,278
Claims priority, application France, Nov. 9, 1967, 127633
Int. Cl. H02j 7/00
U.S. Cl. 320—2 3 Claims



A winding of an electric traction motor of an electric powered vehicle is employed as a smoothing choke in the charging circuit for an accumulator battery which normally supplies the power to the traction motor during vehicle operation.

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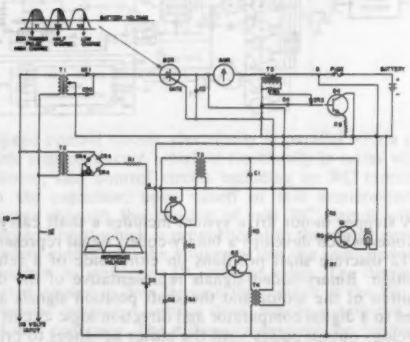
3,586,955

## BATTERY CHARGER USING A CONTROLLED SCR TO PROVIDE TAPERING CHARGING CHARACTERISTICS

Edmund Kisiel, Garfield Heights, Ohio, assignor to Crawford Fitting Company, Solon, Ohio

Continuation of application Ser. No. 603,962, Dec. 22, 1966, now abandoned. This application Mar. 31, 1970, Ser. No. 22,123
Int. Cl. H02j 7/06
U.S. Cl. 320—39 13 Claims



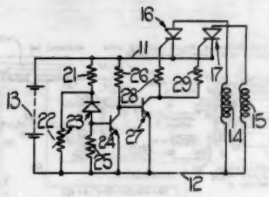
The battery charger comprises a transistorized system comprising a stepdown transformer coupled to a silicon-controlled rectifier, with the power output of the rectifier controlled by a sensing network in circuit with phase shift circuit means. A Zener diode is provided which furnishes a reference voltage applied across a voltage divider in the sensing circuit wherein no current can flow to a battery so long as the battery voltage equals the reference voltage. If the battery voltage drops due to a load or for some other reason, current will bias a transistor into a conduction condition to actuate the phase shift network. The latter is coupled to the silicon-controlled rectifier to gate the rectifier in a manner automatically to charge the battery at a rate inversely proportional to the amount of charge on the battery.

3,586,956

## BATTERY-CHARGING SYSTEMS FOR ROAD VEHICLES

Michael Murray Bertioli, Lichfield, and Malcolm Williams, Solihull, both of, England, assignors to Joseph Lucas Industries Limited, Birmingham, England

Filed Mar. 10, 1969, Ser. No. 805,538
Claims priority, application Great Britain, Mar. 11, 1968, 11688/68
Int. Cl. H02p 9/00
U.S. Cl. 320—40 1 Claim



A battery-charging system for a road vehicle includes a permanent magnet alternator which charges the vehicle battery to a rectifier with which is associated one or more negative gated thyristors for controlling the output of the alternator.

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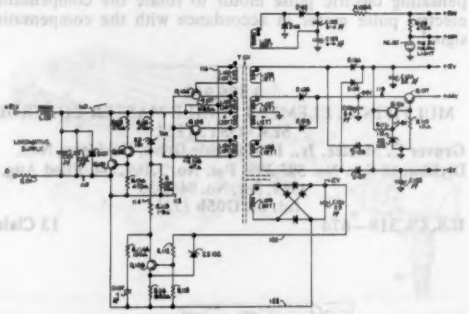
3,586,957

## POWER SOURCE FOR ELECTRONIC CIRCUITRY

George Robert Cass, Montreal, Quebec, Canada, assignor to Canadian National Railway Company, Montreal, Quebec, Canada

Filed Aug. 16, 1968, Ser. No. 753,138
Int. Cl. H02m 3/32; H02p 13/22; H02h 7/14
U.S. Cl. 321—2 3 Claims



Electric power from a 72 v. DC supply is applied through protective elements which reduce the effects of voltage surges and transients on succeeding circuitry to a transistor chopper producing an alternating current output which is preferably transformed and rectified and tapped to provide regulated and unregulated supplies. In one alternative the transformer output is fed back to control the voltage input to the transistor chopper.

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3,586,958

## DC TRANSMISSION DEVICE FOR SUPERCONDUCTIVE CABLE

Wilhelm Kafka, Tennenlohe, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 24, 1969, Ser. No. 809,882
Claims priority, application Germany, Mar. 30, 1968, P 17 63 073.8
Int. Cl. H02m 1/12
U.S. Cl. 321—8 10 Claims

Current converters subjected to an upper harmonic voltage are coupled to each end of a superconductive cable via cor-

responding voltage dividers. Each voltage divider comprises a smoothing inductor, having a low resistance to direct current, coupled to the corresponding converter and a capacitor and an inductor, having a high resistance to direct current, connected to a point at ground potential. The capacitors comprise superconductive material of the cable, covered by electrically insulating material which in turn is covered by inductive material.

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**3,586,959**

## HIGH-VOLTAGE THYRISTOR EQUIPMENT

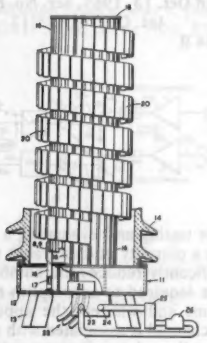
**Arnaud Michael Eccles, and John James Laurence Weaver, both of Stafford, England, assignors to The English Electric Company Limited, London, England**

**Filed Apr. 1, 1969, Ser. No. 811,737**

**Claims priority, application Great Britain, Apr. 2, 1968, May 15, 1968, 15728/68;23116/68**

**Int. Cl. H02m** *7/20;* **H02n** *7/14;* **H02b** *1/00*

**U.S. Cl. 321—8** **10 Claims**



A converter for high-voltage DC transmission schemes comprises a stack of thyristors arranged in a helical configuration around a number of tubular ducts upstanding from a coolant reservoir, the coolant being pumped through these ducts.

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**3,586,960**

## CONTROL ARRANGEMENT FOR SINGLE PHASE BRIDGE CONVERTER

**Narain G. Hingorani, 4307, N.E. Flanders, Portland, Oreg.**

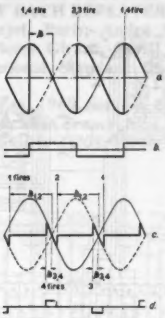
**Filed Mar. 11, 1969, Ser. No. 806,135**

**Claims priority, application Great Britain, Mar. 22, 1968, 13961/68**

**Int. Cl. H02m** *1/12, 1/08*

**U.S. Cl. 321—9** **4 Claims**

In an AC/DC or DC/AC electric converter using controllable rectifiers in the four arms of a single phase bridge arrangement, the firing angle, of the rectifiers in one pair of adjacent arms is controlled separately from that of the rectifiers in the other pair of adjacent arms to provide a reduction in harmonics and an improvement in the power factor.



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**3,586,961**

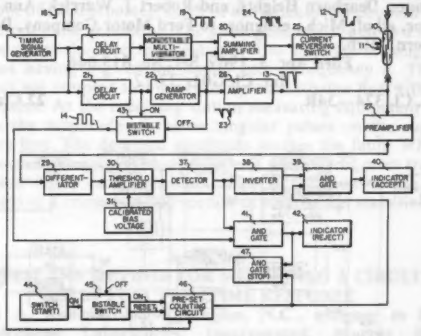
## TESTING RESISTIVITY OF REED RELAY CONTACTS OVER ALL PROBABLY USED MATING SURFACES

**Richard M. Rovnyak, Hanover Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.**

**Filed Aug. 7, 1969, Ser. No. 848,158**

**Int. Cl. G01r** *3/02*

**U.S. Cl. 324—28 RS** **7 Claims**



Signal generator circuits are connected to a reed switch under test to apply linearly changing current simultaneously to an operating coil and to its reed blades. Voltage developed across the contacts is amplified and differentiated while the changing current twists the blades as a result of magnetostriction. When the contacts are made through rough or contaminated areas as they are being moved by the twisting of the blades, the differentiated voltage exceeds a reference voltage and causes an indication of rejection.

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**3,586,962**

## BATTERY CELL MONITORING APPARATUS

**Edward C. Rebstock, 528 Stolp Ave., Syracuse, N.Y.**

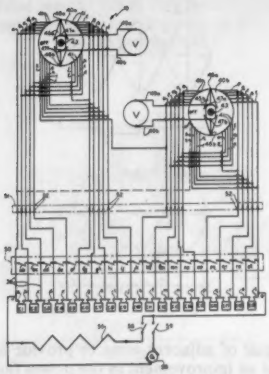
**Filed Feb. 28, 1969, Ser. No. 803,242**

**Int. Cl. G01n** *27/42*

**U.S. Cl. 324—29.5** **1 Claim**

Monitoring apparatus for a series-connected battery of cells includes a lid equipped with biased contacts arranged so each contact contacts a different one of the cell connectors when in place. Wires from each contact run through a multiprong coupler to a contact of a double wafer switch, a plu-

rality of switches being adapted each to connect pairs of wires for shorting out any selected cell. Each switch wafer has its contacts arranged to successively or selectively con-



nect the connectors on either side of each cell across a voltmeter, the first wafer for about half the cells and the second wafer for the other cells for reading voltages for a pair of cells for each wafer switch position.

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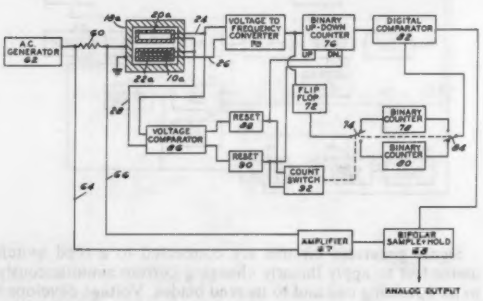
**3,586,963**

**MAGNETICALLY DETERMINING MECHANICAL PROPERTIES OF MOVING FERROMAGNETIC MATERIALS**

**Anthony Arrott, West Vancouver, B. C., Canada; Richard L. Dennis, Dearborn; Carl H. Haakana, Detroit; Robert G. Jones, Dearborn Heights, and Robert J. Warrick, Ann Arbor, all of, Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Apr. 3, 1969, Ser. No. 813,046**
**Int. Cl. G01r *33/12***
**U.S. Cl. 324—34R** **22 Claims**



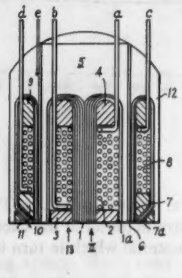

A moving strip of sheet steel passes through a magnetic field that brings the magnetization in the sheet to effective saturation first in one direction and then in the other direction. As the sheet emerges from the applied field, the magnetization passes from the remanent value of one sign to the remanent value of the other sign. Sensing coils measures the flux change produced by passing from one remanent magnetization to the other and this flux change is halved to give the flux change necessary to reach a computed zero value of magnetization. The applied field necessary to maintain the magnetization in the sheet at the computed zero value represents the coercive force of the sheet, which is proportional to various mechanical properties of the steel such as the tensile strength. Instead of using remanent magnetization to compute the zero value, the sensing coils can be located within the applied magnetic field and the flux change produced by passing between the magnetization at saturation can be used.

**3,586,964**

**INDUCTIVE TRANSDUCERS**

**Heinrich Strauch, Leamington Spa, England, assignor to Associated Engineering Limited, Leamington Spa, England**

**Filed Apr. 30, 1969, Ser. No. 820,409**
**Claims priority, application Great Britain, May 8, 1968, 21873/68**
**Int. Cl. G01r *33/00*; H01f *15/02, 27/24***
**U.S. Cl. 324—34** **12 Claims**



The present invention relates to inductive transducers and discloses constructions of such transducers having two concentrically arranged coil and core assemblies wherein the cores are formed of ferromagnetic material and have their ends terminating at the working face of the transducer. In operation, the coils of the transducer may be connected in the opposed arms of a bridge circuit, thereby producing a substantially linear output from the bridge circuit.

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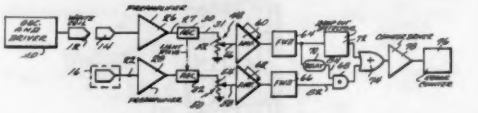
**3,586,965**

**APPARATUS FOR TESTING AND EVALUATING A MAGNETIC MEDIUM FOR DEFECTS**

**Dale C. Whysong, Falls Church, and John F. Walton, McLean, both of, Va., assignors to General Kinetics, Inc., Reston, Va.**

**Filed Oct. 13, 1969, Ser. No. 865,741**
**Int. Cl. G01r *33/12***
**U.S. Cl. 324—34 R** **10 Claims**



Apparatus for testing and evaluating a magnetic recording medium having a plurality of data tracks thereon wherein the apparatus significantly reduces the number of electronic circuits heretofore required to accomplish the complete testing of such mediums and wherein the apparatus provides two channels. One channel is associated with a reference or clock track while the other channel is associated with the remaining tracks on the medium. A separate transducer head is provided for each of the individual tracks and predetermined pairs of the transducer heads other than the reference transducer heads are connected in electrical parallel and opposing relationship whereby the apparatus indicates the presence of defects in the medium in any one of the tracks without the necessity of supplying a separate channel for each track.

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**3,586,966**

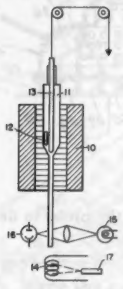
**APPARATUS AND METHODS FOR ELECTRODELESS MEASUREMENT OF RESISTIVITY AND PROXIMITY OF MATERIALS**

**Robert W. Halsty, 1237 Mohawk, Richardson, Tex., and Heinz M. Krebs, 700 Stuttgart Vaihingen, Weinbergweg 68, Germany**

**Filed Jan. 25, 1968, Ser. No. 700,401**
**Int. Cl. G01r *33/00***
**U.S. Cl. 324—40** **22 Claims**

Disclosed are methods and apparatus for contact-free or electrodeless measurement of specific resistivity and

photoconductivity of materials. Also disclosed are methods and apparatus for determining relative motion and position of a body. The apparatus includes inductance means and oscillator circuitry for determining eddy current losses in a



material moved through or near the inductance means. Apparatus and methods are also disclosed for determining eddy current losses in materials inductively and/or capacitively coupled with such circuitry.

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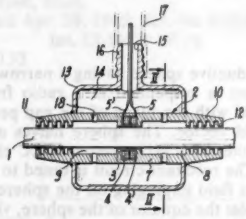
**3,586,967**

## PNEUMATIC CENTERING DEVICE

**Jean-Pierre Peyrot, Villejuif; Marie-Therese Destribats, Orsay, and Michel Pigeon, Bures-sur-Yvette, all of, France, assignors to Commissariat A L'Energie Atomique, Paris, France**

**Filed Apr. 23, 1969, Ser. No. 818,759**
**Claims priority, application France, May 7, 1968, 150,892**
**Int. Cl. G01r *33/00*; F16c *7/04, 35/00***
**U.S. Cl. 324—40** **8 Claims**



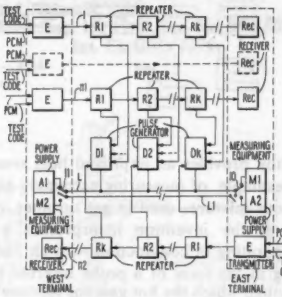
A pneumatic centering device for the inspection of cylindrical or tubular metal parts by nondestructive methods such as eddy-current testing. The device is centered relative to the part to be tested and comprises a tubular casing fitted or integral with a projecting annular coil form. Two annular chambers are defined on each side of said coil formed between the surface of said part and the tubular casing. The annular chambers are closed by endpieces which are integral with the casing and have radial partition walls so as to form within each chamber adjacent compartments which are limited by the part to be tested. At least one aperture is provided within each chamber for the admission of compressed fluid so as to produce pneumatic cushions within the compartments of said chambers, the function of the cushions being to center the tubular casing relative to the part to be tested.

**3,586,968**

## FAULT LOCATING SYSTEM FOR A TRANSMISSION LINE HAVING A PLURALITY OF REPEATERS INCLUDING A DETECTOR COUPLED TO THE OUTPUT OF EACH REPEATER

**Michel Francois Barjot, Paris; Andre Edouard Chatelon, Montrouge, and Pierre Girard, Paris, all of, France, assignors to International Standard Electric Corporation, New York, N.Y.**

**Filed Mar. 6, 1969, Ser. No. 804,876**
**Claims priority, application France, Mar. 8, 1968, 142,899**
**Int. Cl. G01r *31/08*; H04b *3/46***
**U.S. Cl. 324—52** **10 Claims**




In a PCM communication system including a transmission line having a plurality of repeaters therealong, one at the end of each section of the line, a fault is located as follows. A repetitive code having a fundamental frequency F is propagated over the line from a transmitting station. A different detector responsive to frequency F is coupled to the output of each repeater. Each of the detectors is coupled to a different pulse generator. The pulse generators, before a fault responds to the detected frequency F to generate rectangular pulses having a given amplitude and a frequency F. These pulses are coupled to a supervisory transmission line without repeaters. At the receiving station measuring equipment detects the amplitude of the rectangular pulses on the supervisory line. The detected amplitude locates the fault. Where the communication system includes a plurality of main transmission lines, each pulse generator is common to the repeaters of a corresponding section of each of the main lines.

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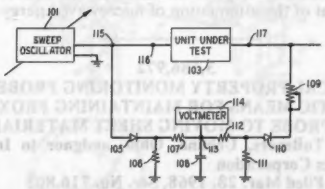
**3,586,969**

## SYSTEM AND METHOD FOR MEASURING A CIRCUIT'S STEP FUNCTION TIME RESPONSE

**John A. Rudisill, Jr., Burlington, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed June 13, 1969, Ser. No. 833,012**
**Int. Cl. G01r *27/00***
**U.S. Cl. 324—57 R** **6 Claims**

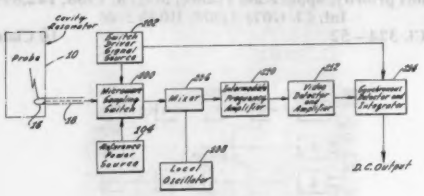



A simple means for determining two values of the time response that a circuit under test would have to a unit step input is disclosed. The apparatus utilizes the frequency response of the circuit to provide this time response information, thus eliminating the usual requirement that the testing circuitry have a faster response time than the circuit being tested.

## 3,586,970
## HOT GAS TEMPERATURE SENSOR

William H. Conway, 2553 Angel Crest Drive, and Philip J. Caruso, Jr., 15611 Del Prado Drive, both of Hacienda Heights, Calif.

Filed Dec. 27, 1968, Ser. No. 787,338
Int. Cl. G01r 27/04
U.S. Cl. 324—58.5 3 Claims

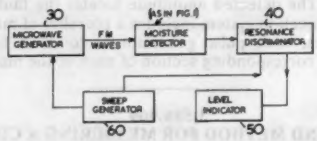



The invention provides an improved heat sensor which is capable, for example, of measuring extremely high temperatures of gaseous mixtures used in gas turbines, and the like. The system of the invention incorporates a microwave radiometer operating in conjunction with an "antenna," the antenna being in the form of a probe inserted into a cavity resonator through which the hot gaseous mixture passes.

## 3,586,971
## MICROWAVE APPARATUS FOR ASCERTAINING CHANGES IN DIELECTRIC PROPERTIES UTILIZING A SLOW WAVE STRUCTURE

Renato G. Bosisio, Montreal, Quebec, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Feb. 10, 1969, Ser. No. 797,999
Int. Cl. G01r 27/04
U.S. Cl. 324—58.5 C 8 Claims



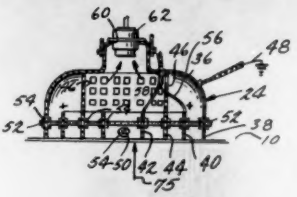

This apparatus for the determination of the dielectric properties, including moisture content, of substances utilizes slow wave resonance shift in a slow wave structure due to variations in the dielectric properties of specimen of substances disposed parallel to the axis of the structure. It is not necessary to utilize the prior known techniques involving the measurement of the attenuation of microwave energy.

## 3,586,972
## ELECTRICAL PROPERTY MONITORING PROBE WITH PNEUMATIC MEANS FOR MAINTAINING PROXIMITY OF PROBE TO MOVING SHEET MATERIAL

Harry W. Tulleners, Urbana, Ohio, assignor to Industrial Nucleonics Corporation

Filed Mar. 28, 1968, Ser. No. 716,803
Int. Cl. G01n 27/26
U.S. Cl. 324—61 2 Claims

For monitoring the moisture content of strip material such as paper while it is being manufactured or wound, a dielectric gauge probe is provided including concentric, circular or spiral plates, adjacent circular plates or turns of spiral plates being of opposite polarity, the probe being arranged for edgewise presentment of the plates to the moving strip, a hood being provided about the plates. Negative air pressure maintaining apparatus is communicated to the interior of the hood, and through a passage in the probe to the strip of

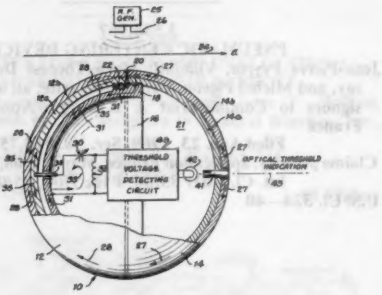



material for maintaining the probe in desired adjacency with a surface of the strip.

## 3,586,973
## STANDARD FIELD STRENGTH METER

Robert A. Lawton, and Charles McKay Allred, both of Boulder, Colo.

Filed Dec. 15, 1969, Ser. No. 884,952
Int. Cl. G01r 31/02
U.S. Cl. 324—72 7 Claims




A hollow conductive sphere having a narrow insulated gap along an equator is suspended in a radio frequency electromagnetic field with the plane of the gap perpendicular to the electric field vector. The sphere halves are electrically connected together by a series resonant LC circuit disposed in the sphere. The resonant circuit is tuned to the frequency of the field. The field impinging on the sphere causes a current to flow across the equator of the sphere, via the resonant circuit. The field strength can accurately be related to the resonant current by an analysis of the scattering of the field by the sphere. To measure the current, the sphere contains a circuit for detecting the voltage developed across the inductance of the LC circuit and for energizing a miniature incandescent lamp when the detected voltage exceeds a threshold value. The light from the lamp is visible through a small diameter tube disposed through the sphere wall (the tube is a waveguide below cutoff for the impinging field). The sphere thus provides an optical indication when the field exceeds a threshold or standard field value. The sphere is calibrated by adjusting the threshold circuit to cause the lamp to light when the appropriate radio frequency current is passed through the resonant circuit. The calibration current is applied to the sphere by means of two hollow conductors of the same diameter as the sphere which are connected to the two sphere halves near the equator containing the insulated gap. The two hollow conductors form the inner conductor of a coaxial line. The calibration current applied to the coaxial line thus flows across the gap just as the induced current does when the sphere is in the field being tested.

3,586,974

## RESET MECHANISM FOR A CUMULATIVE DEMAND REGISTER

Donald M. Ham, Rochester, and Joseph G. Russillo, Jr., Dover, both of, N.H., assignors to General Electric Company

Filed Apr. 2, 1969, Ser. No. 812,670
Int. Cl. G01r *19/16*
U.S. Cl. 324—103 R 20 Claims

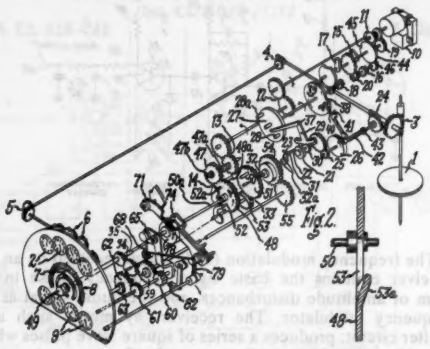


Fig. 2.

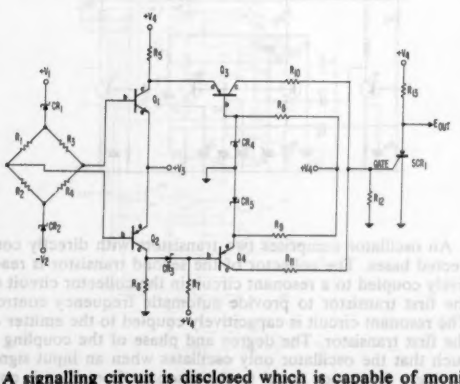
A demand register reset mechanism that is characterized by having resiliently mounted gears that insure proper gear meshing without risk of jamming its gears when the reset mechanism is actuated. In the idle condition of the reset mechanism, the gears of the mechanism are locked in a fixed position. The reset mechanism is further characterized by utilizing a gear shifting means that can be ultrasonically cleaned without damaging any of its components, and that can be easily and precisely calibrated.

3,586,975

## A VOLTAGE MONITORING CIRCUIT FOR SIMULTANEOUSLY DETECTING EXCESSIVE EXCURSIONS OF A PLURALITY OF PRIMARY VOLTAGE SOURCE

L. V. Colvson, Philadelphia, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 30, 1969, Ser. No. 820,604
Int. Cl. G01r *19/16*
U.S. Cl. 324—133 10 Claims



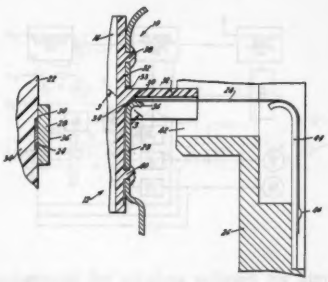
A signalling circuit is disclosed which is capable of monitoring primary voltages used in electronic circuitry. For example, in the present application the primary direct current voltages used in an electronic digital computer are monitored. The variation of any one of a plurality of these primary voltages above or below a predetermined value causes the creation of a status signal. Thus, maximum or minimum values are specified for each of the voltages and any excursion above or below these preset limits initiates an error output voltage. This over/under voltage detector is mechanized with balanced passive and active electrical bridge circuits connected in tandem. The design approach employs only essential components which will be somewhat the same number of components to build one of the circuits using the conventional approach wherein a separate circuit is used for each voltage to be monitored.

3,586,976

## TORSION BAND SUSPENSION FOR ROTATABLE ELECTRICAL INSTRUMENT

Henry R. Woolner, Manchester, N.H., assignor to Modutec Incorporated, Norwalk, Conn.

Filed Aug. 15, 1969, Ser. No. 850,509
Int. Cl. G01r *1/00*
U.S. Cl. 324—154 21 Claims



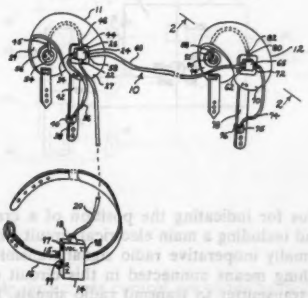
A rotor is mounted for rotation with respect to a stator by a torsion band formed of a relatively hard material secured to and tensioned between rotor and stator mounting elements. One of these mounting elements has a part formed of a relatively soft and self-sustaining material. The band is urged against the soft material part with a force sufficient to cause the band to form a recess in the soft material part. The band is snugly received in that self-formed recess to ensure accurate rotational positioning of the rotor.

3,586,977

## COMMUNICATION SYSTEM FOR HELMETED MOTORCYCLE RIDERS

Harvey V. Lustig, 2234 National Drive, Brooklyn, N.Y.; Ira Klein, 1439 52nd St., Brooklyn, N.Y., and Donald G. Lamb, 2633 Ocean Ave., Brooklyn, N.Y.

Filed Jan. 2, 1969, Ser. No. 788,453
Int. Cl. H04b *1/38*
U.S. Cl. 325—16 2 Claims



The disclosure describes a system providing voice intercommunication between a motorcycle rider and a passenger when both are wearing motorcycle helmets. The system employs a transistor radio with switching means to enable it to

be used selectively for intercommunication purposes and for receiving radio broadcasts.

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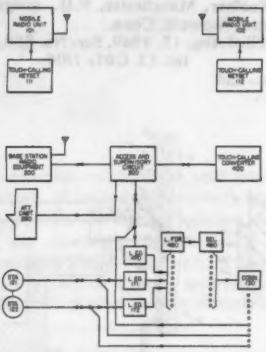
**3,586,978**

## TOUCH CALLING RADIO TELEPHONE TERMINAL

**Duyck Van Gorder, Elmhurst, Ill., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.**

**Filed Apr. 15, 1969, Ser. No. 816,232**
**Int. Cl. H04b 5/04; H04j 1/14**
**U.S. Cl. 325—55** **7 Claims**



A circuit designed to provide an interface between a private automatic telephone exchange and a base radio station serving mobile radio units equipped with touch calling units. The base radio equipment normally acts as a repeater station between mobile units, when not handling calls between the mobile radio units and the telephone system. Touch calling selection by mobile radio units of telephone stations and dial access by telephone stations of radio equipment with voice paging of individual mobile radio units is included.

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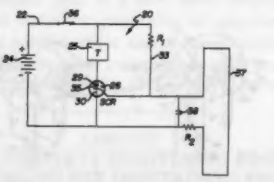
**3,586,979**

## CRAFT POSITION INDICATING APPARATUS

**Harold R. Hine, 1325 Ottaburn Ave., Vancouver, and Edward F. Dawson, 3085 Comox Ave., Comox, both of, Canada**

**Filed Nov. 6, 1968, Ser. No. 773,917**
**Int. Cl. H04b 1/02**
**U.S. Cl. 325—115** **15 Claims**



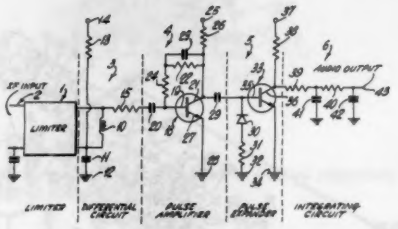
Apparatus for indicating the position of a craft that has crashed and including a main electrical circuit with a battery and a normally inoperative radio signal transmitter therein with switching means connected in this circuit operable to cause the transmitter to transmit radio signals, and control means in the form of a fragile electrical conductor or a fragile tube containing fluid under pressure, to be extended throughout the craft where the control means will be interrupted if the craft crashes. The control means is connected to the switching means to operate the latter when the control means is interrupted as a result of the crash.

**3,586,980**

## FREQUENCY MODULATION-DEMODULATION CIRCUIT

**Friedrich J. Krausser, Jericho, N.Y., assignor to Emerson Electric Co.**

**Filed Nov. 13, 1967, Ser. No. 682,064**
**Int. Cl. H03d 3/04**
**U.S. Cl. 325—349** **5 Claims**




The frequency modulation (FM) signal received by an FM receiver contains the basic signal frequency, noise in the form of amplitude disturbances, and the audio signal as the frequency modulator. The receiver, by means such as a limiter circuit, produces a series of square wave pulses whose repetition rate is dependent upon the frequency deviation, i.e., the modulation signal. Then, in a discriminator counter detector circuit, the square wave pulse is differentiated to the form of a sharp pulse by means such as a differential network. The pulse may then be amplified by means such as a pulse amplifier; the width of the pulse—but not its height—is expanded by an expanding circuit; and then the pulse may be integrated by an integrating circuit. The output of the integrating circuit is the demodulated audio signal.

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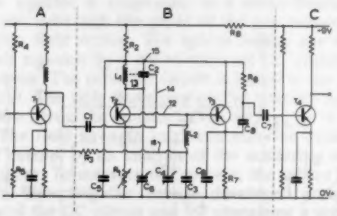
**3,586,981**

## CARRIER SIGNAL TRIGGERED OSCILLATOR AND DEMODULATOR CIRCUIT

**Horace A. Johns, Petersfield, England, assignor to Ugo International N.V., Curacao, Dutch Antilles, Netherlands**

**Filed Aug. 30, 1968, Ser. No. 756,438**
**Claims priority, application Great Britain, Sept. 1, 1967, 40197/67**
**Int. Cl. H03b 5/12; H04b 1/16**
**U.S. Cl. 325—349** **10 Claims**




An oscillator comprises two transistors with directly connected bases. The collector of the second transistor is reactively coupled to a resonant circuit in the collector circuit of the first transistor to provide automatic frequency control. The resonant circuit is capacitively coupled to the emitter of the first transistor. The degree and phase of the coupling is such that the oscillator only oscillates when an input signal having a frequency equal to the resonant frequency is continuously present at the emitter of the first transistor. If the input signal is an amplitude or frequency modulated carrier frequency signal, the oscillator oscillates and the demodulation pattern appears at the output. The oscillator is thus useful in demodulation circuitry, particularly radio and television receivers.

## ERRATUM

For Class 325—362 see:
Patent No. 3,587,017

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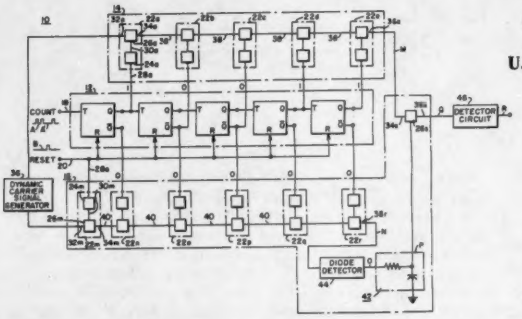
### 3,586,982
### PULSE COUNT DETECTOR HAVING FAIL-SAFE FEATURES

Robert C. Hoyler, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 19, 1969, Ser. No. 800,611
Int. Cl. H03k 21/32
U.S. Cl. 328—48 5 Claims




A flip-flop digital counter is reset periodically by a reset pulse, and upcounted by count pulses. A network is connected to the individual flip-flop outputs to sense presence of a predetermined count condition in the counter together with dynamic behavior of the individual flip-flops. Another network is connected to the individual flip-flops and to the input connection to the reset line to detect simultaneous resetting to zero condition of each flip-flop with appearance of a reset pulse. The output of these two networks is passed to another network with checks for presence of both the count condition and such reset in each count cycle.

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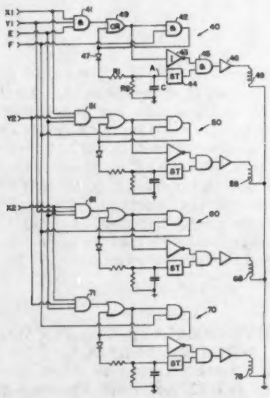
### 3,586,983
### PRINT HAMMER CONTROL SYSTEM

Lynn W. Marsh, Jr., Melrose, Mass., assignor to Mohawk Data Sciences Corporation, East Herkimer, N.Y.

Filed Nov. 25, 1968, Ser. No. 778,500
Int. Cl. H03k 17/02
U.S. Cl. 328—75 7 Claims



A print hammer firing circuit incorporating secondary storage includes a Schmitt trigger, two logical AND circuits and a logical OR circuit. One of the AND circuits and the OR circuit are mutually interconnected input-to-output to provide the storage function and to drive the Schmitt trigger. The second AND circuit is connected to gate the trigger output under control of the storage circuit. An integrating network at the trigger input causes the gated output, which drives the hammer coil, to define an accurate hammer actuation time interval.

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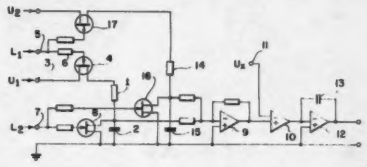
### 3,586,984
### ARRANGEMENT FOR GENERATING VOLTAGES FOR AIMING A GUN

Carl-Erik Granqvist, Lidingo, and Klas Rudolf Wiklund, Lahall, both of, Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden

Filed Oct. 14, 1968, Ser. No. 767,254
Claims priority, application Sweden, Oct. 13, 1967, 14054
Int. Cl. G06g 7/14
U.S. Cl. 328—147 5 Claims



An arrangement for creating voltages for aiming a gun, such as for lateral correction or correction of the elevation of the gun making use of the similarity between the charging or discharging function of a capacitor in a series circuit comprising a resistor and a capacitor and the required correction as a function of the firing range of the gun.

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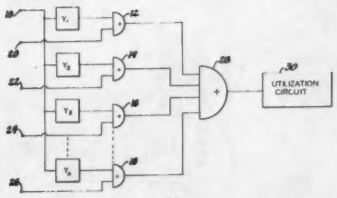
### 3,586,985
### VARIABLE DUTY CYCLE CONTROL GENERATOR

Arthur J. Schoendorff, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1969, Ser. No. 885,753
Int. Cl. H03k 5/04
U.S. Cl. 328—61 7 Claims



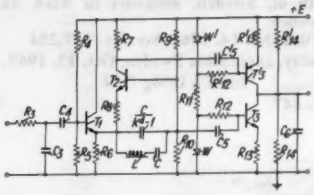

A variable duty cycle control generator having a plurality of time delay circuits, each having a common input comprised of a series of equal duration rectangular pulses for generating a plurality of pulse waveforms, each having a respective duty cycle. The waveform having the desired duty cycle is selected by gating the waveform with a respective control signal which enables the waveform to be utilized.

3,586,986

## FREQUENCY DISCRIMINATOR

Jean Victor Martens, Deurne-Zuid, and Marcel Clement Rene Natens, Antwerpen, both of, Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 19, 1969, Ser. No. 800,434
Claims priority, application Netherlands, Mar. 12, 1968, 6803475
Int. Cl. H03d 3/26
U.S. Cl. 329—103 7 Claims



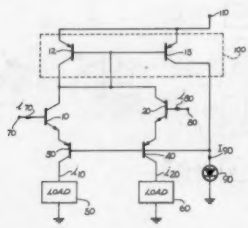
A frequency selective network is coupled to an input signal source and two output detecting circuits to produce the desired output signal. The selective network is coupled in parallel with the source and includes a two terminal reactive network exhibiting at least one reversal of sign at a predetermined frequency in series with a two terminal resistive network. One of the detecting circuits includes a unity gain transistor amplifier coupled to be responsive to the voltage across the reactive network, and a first output transistor coupled to the output of the amplifier. The other of the detecting circuits includes a second output transistor coupled to be responsive to the voltage across the resistive network. The first output transistor is of a conductivity type opposite to the conductivity type of the second output transistor and the transistor of the amplifier and the collectors of the first and second output transistors are connected directly together to provide the desired output signal.

3,586,987

## TRANSISTOR BIAS CIRCUIT

David J. Fullagar, Los Altos, Calif., assignor to Fairchild Camera and Instrument, Sydsset, Long Island, N.Y.

Filed Apr. 10, 1969, Ser. No. 815,042
Int. Cl. H03f 3/04
U.S. Cl. 330—22 4 Claims



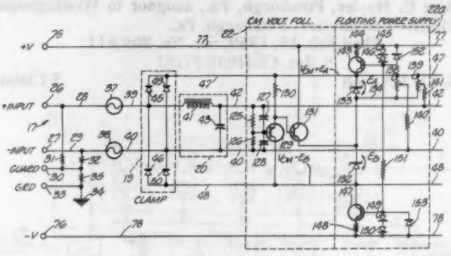
A circuit for biasing transistors particularly suited for monolithic circuits utilizes a pair of NPN-PNP input transistors operating in conjunction with a constant-current source. The biasing circuit enables the input bias current to be substantially independent of the current gain of the PNP transistors.

3,586,988

## DIRECT COUPLED DIFFERENTIAL AMPLIFIER

Barret B. Weekes, Newport Beach, Calif., assignor to Newport Laboratories, Newport Beach, Calif.

Filed Dec. 1, 1967, Ser. No. 687,226
Int. Cl. H03f 1/00
U.S. Cl. 330—30D 16 Claims



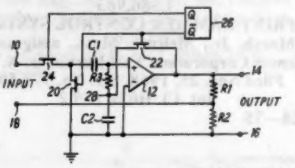
A solid-state direct-coupled differential potentiometric amplifier including a differential voltage-to-current $G_m$ amplifier in cascade with a differential current-to-voltage $R_m$ amplifier. The $G_m$ amplifier is driven at a common mode voltage by a common mode voltage amplifier coupled as a power supply thereto, with the common mode voltage being detected at the signal input terminals. It is not necessary to differentially balance the differential gain-determining network of the $G_m$ amplifier, nor the feedback resistors which determine the transresistance of the $R_m$ amplifier.

3,586,989

## TIME SHARED AMPLIFIERS

Desmond Wheable, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Filed Dec. 4, 1969, Ser. No. 882,175
Claims priority, application Great Britain, Dec. 31, 1968, 61927/68
Int. Cl. H03f 3/16,
U.S. Cl. 330—51 7 Claims



In known time shared amplifiers, voltage drift stabilization is effected by periodically shorting the amplifier output to the amplifier input while connecting the input terminal to a reference potential to charge an input character, which then supplies a corrective offset. This does not however effect current drift stabilization, which is effected according to the invention by a capacitor and resistor in series between the amplifier input and the reference potential. The amplifier output is now periodically shorted to the junction of the resistor and capacitor. The charge established on the capacitor then supplies an offset current through the resistor.

3,586,990

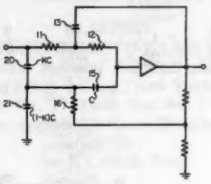
## LOW-PASS ACTIVE PARALLEL-T FILTER WITH ZERO SOURCE IMPEDANCE

Gideon Willoner, North Vancouver, British Columbia, Canada, assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Oct. 30, 1969, Ser. No. 872,719
Int. Cl. H03f 1/36
U.S. Cl. 330—107 2 Claims

The input of the capacitive series arm contains two capacitors to function as the first series capacitor and also as an

input voltage divider, the divider being connected between a source of input signal and the capacitive series arm to provide low-pass characteristics. Compared with low-pass filters



using resistive voltage dividers, the resistance between the series capacitors and the source of input signal is low, and therefore the series capacitive arm has true reactance.

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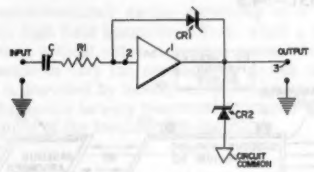
**3,586,991**

**OVERLOAD PROTECTION CIRCUIT FOR AMPLIFIER**

**Robert E. Vosteen, 315 W. Center St., Medina, N.Y.**

**Filed Sept. 16, 1968, Ser. No. 759,914**
**Int. Cl. H03f** *21/00*
**U.S. Cl. 330—207 P** **10 Claims**




An overload protection circuit for an amplifier wherein the operational potential of elements comprising the amplifier are limited to a value less than their destruction potential. The protection circuit employs zener diodes or elements having similar characteristics connected to the amplifier to preclude the application of potentials thereto that are capable of destroying elements comprising the amplifier.

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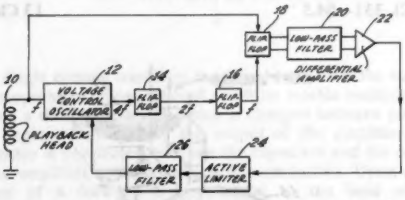
**3,586,992**

**CLOCK GENERATOR WITH FREQUENCY CONTROL LOOP CONTAINING AN OSCILLATORY LIMITER**

**Allen E. Garfein, Woodland Hills, Calif., assignor to Engineered Data Penpherals Corporation, Santa Monica, Calif.**

**Filed Oct. 9, 1969, Ser. No. 865,055**
**Int. Cl. H03b** *3/06*
**U.S. Cl. 331—17** **12 Claims**




A clock generator which produces a stabilized clock output signal and which is used with a storage system including a storage medium and wherein the storage medium includes a reference track to produce a reference signal which is coupled as an input to the clock generator. The clock generator includes a variable voltage-controlled oscillator and incorporates a feedback path to control the output from the clock generator. The feedback path includes an active limiter so as to provide for a very fast response in the feedback path without producing unwanted modes in the output signal from the clock generator. The active limiter includes a pair of voltage sensors for sensing excessive plus or minus excursions of the feedback signal relative to the reference potential and wherein the voltage sensors control an electronic switch to short out the feedback path when the excursion of the feedback signal is above a particular level in a plus or minus direction relative to the reference potential. The electronic switch operates in an oscillatory manner until the level of the feedback signals falls within the permissible range of excursion.

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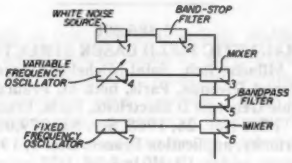
**3,586,993**

**TESTING INSTRUMENTS FOR TELECOMMUNICATION SYSTEMS**

**William Alex Buck, Englewood, N.J., assignor to Marconi Instruments Limited, London, England**

**Filed Aug. 11, 1969, Ser. No. 848,864**
**Claims priority, application Great Britain, Aug. 14, 1968, 38861/68**
**Int. Cl. H03b** *29/00*
**U.S. Cl. 331—78** **2 Claims**




In a "while noise" test set a mixer is fed from a source of white noise via a narrow band-stop filter and from a variable frequency oscillator, a predetermined band of frequencies from the output of the mixer being fed to a second mixer with oscillators from a fixed frequency oscillator. The arrangement is such that the output from the second oscillator consists of a noise frequency band including a narrow "silent slot," the position of which is variable over said band by varying the frequency of the variable frequency oscillator.

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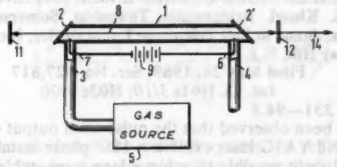
**3,586,994**

**LASER DEVICE WITH GASEOUS MEDIUM FOR INCREASED ENERGY OUTPUT**

**Dieter Rosenberger, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed May 17, 1967, Ser. No. 639,235**
**Claims priority, application Germany, May 18, 1966, 103872**
**Int. Cl. H01s** *3/22*
**U.S. Cl. 331—94.5** **11 Claims**




The gaseous medium for a laser device for radiation amplification comprises carbon dioxide at a partial pressure of about 1.0 Torr, nitrogen at a partial pressure of about 4.0 Torr and hydrogen at a partial pressure of about 0.1 to 1.0 Torr.

3,586,995

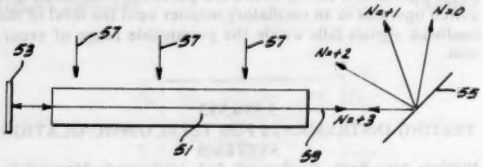
## MULTIBEAM LASER

Richard A. Hubach, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of application Ser. No. 717,501, Apr. 1, 1968, now abandoned. This application May 21, 1970, Ser. No. 41,667

Int. Cl. H01s 3/00

U.S. Cl. 331—94.5 9 Claims




This is a laser that provides two or more output beams directly from the laser resonant cavity and includes an active laser element disposed in a resonant cavity consisting of a substantially totally reflective mirror at one end and a specially designed and oriented grating element at the other end which diffracts incident laser radiation into three or more orders depending upon the number of output beams desired.

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3,586,996

## MAGNETIC FIELD LASER STRUCTURE

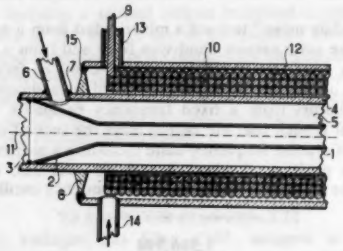
Alexandre Milochevitch, Saint-Michel-sur-Orge, and Andre De La Forest Divonne, Paris, both of, France, assignors to Compagnie Generale D'Electricite, Paris, France

Filed Nov. 26, 1968, Ser. No. 779,090

Claims priority, application France, Dec. 1, 1967, 130,677

Int. Cl. H01s 3/04, 3/22

U.S. Cl. 331—94.5 3 Claims




A gas laser having electromagnetic means to concentrate plasma in the laser tube's capillary and formed by three spaced, coaxial tubes, the inner and first of which defines the capillary, the first and second forming a duct for a cooling fluid and the second and third forming a cooled area for a solenoid.

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3,586,997

## STABILIZED MODE-LOCKED LASER ARRANGEMENT

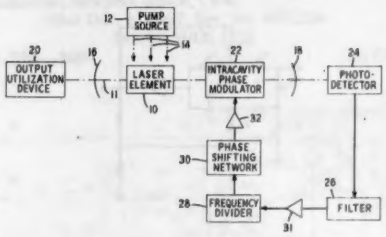
Tracy S. Kinsel, Bridgewater Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 26, 1969, Ser. No. 827,817

Int. Cl. H01s 3/10; H03c 3/00

U.S. Cl. 331—94.5 10 Claims

It has been observed that the pulse-train output of a mode-locked Nd:YA1G laser exhibits a 180° phase instability. As a result it is not possible to achieve long term stable operation of such a laser by abstracting from the output pulse train a signal whose frequency corresponds to the axial-mode fundamental beat frequency. However, the phase of the second harmonic of this fundamental beat frequency which may be abstracted from the output pulse train does not exhibit such a 180° phase instability. Accordingly this second harmonic signal can be utilized as a discriminant from which a fundamental signal may be derived. In turn this derived fundamental signal is applied to drive an intracavity phase modulator. In this way the laser is stabilized in its mode-locked state by




feedback techniques despite the aforementioned phase-instability characteristic.

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3,586,998

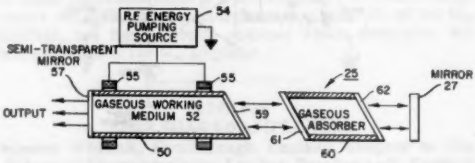
## PULSED LASER OUTPUT CONTROL

Gordon Gould, 329 E. 82 St., New York, N.Y.

Continuation of application Ser. No. 345,903, Feb. 19, 1964, now abandoned. This application July 28, 1969, Ser. No. 854,006

Int. Cl. H01s 3/11, 3/10, 1/06

U.S. Cl. 331—94.5 12 Claims




"Giant pulse" laser apparatus is described in which an absorber material is disposed in the resonant cavity in a concentrated portion of the beam of light emitted by the pumped working medium (being preferably the same substance as the absorber material) so as to raise the energy threshold level at which oscillation occurs. Upon absorbing a sufficient level of emitted radiation, the absorber material becomes transparent to the emitted radiation, thus releasing the energy stored in the working medium as a "giant pulse."

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3,586,999

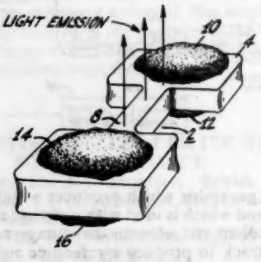
## FIELD-EXCITED SEMICONDUCTOR LASER WHICH USES A UNIFORMLY DOPED SINGLE CRYSTAL

Peter D. Southgate, Princeton, N.J., assignor to RCA Corporation

Continuation-in-part of application Ser. No. 689,459, Dec. 11, 1967, now abandoned. This application Oct. 16, 1968, Ser. No. 768,150

Int. Cl. H01s 3/18

U.S. Cl. 331—94.5 13 Claims




A field-excited semiconductor infrared laser which comprises a single-crystal, uniformly doped body of N-type galli-

um arsenide or indium phosphide having opposed major faces optically flat and substantially parallel to each other, and means on opposite end portions of the body for passing an electrical current through the body.

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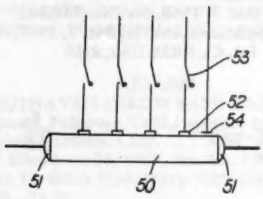
**3,587,000**
**SEMICONDUCTIVE CIRCUIT**

**John Stuart Heeks, Harlow, England, assignor to International Standard Electric Corp., New York, N.Y.**

**Filed Nov. 27, 1968, Ser. No. 779,416**
**Claims priority, application Great Britain, Feb. 22, 1968, 8740**
**Int. Cl. H03b** *7/06*
**U.S. Cl. 331—107** **3 Claims**




This is a semiconductor device consisting of a material which exhibits high field instability effects when a potential which exceeds a critical value is applied across the device. Electronic means to vary the conductivity profile along the domain path is provided by having rectifying junctions along the side of the device to vary the minority carrier injections from one or more of the localized PN-junctions.

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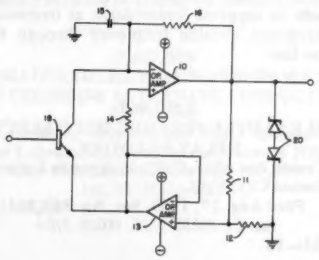
**3,587,001**
**START-STOP OSCILLATOR CONTROL CIRCUIT**

**Norman J. Parchim, Des Plaines, Ill., assignor to Teletype Corporation, Skokie, Ill.**

**Continuation of application Ser. No. 716,494, Mar. 27, 1968, now abandoned. This application Feb. 2, 1970, Ser. No. 7,386**
**Int. Cl. H03k** *3/08*
**U.S. Cl. 331—111** **10 Claims**




A single control transistor is utilized to control the starting and stopping of an operational amplifier astable multivibrator having a timing capacitor which is charged between positive and negative voltages by the output of the amplifier. The transistor is connected between the capacitor and the output of the amplifier and normally is nonconductive. Upon application of a forward bias potential to the base of the transistor, the capacitor rapidly charges to the amplifier output voltage, provided the collector-emitter junction of the transistor is forward-biased at the time the bias potential is applied. If the collector of the transistor is reverse-biased by the capacitor charge and the amplifier output voltage at the time the bias potential is applied to the base of the transistor, the capacitor is charged through the base-collector junction of the transistor to a value sufficient to cause the multivibrator to switch states, after which the capacitor discharges toward the amplifier output voltage through the collector of the transistor in the normal manner.

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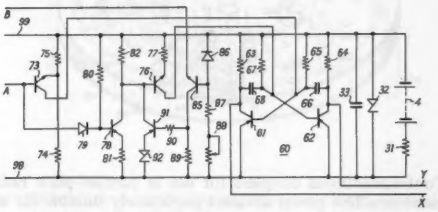
**3,587,002**
**VOLTAGE-CONTROLLED TRANSISTOR MULTIVIBRATOR**

**Christopher Robin Brown, Ipswich, Suffolk, England, assignor to Ransomes Sims & Jefferies Limited**

**Filed July 22, 1969, Ser. No. 844,737**
**Int. Cl. H03k** *3/282, 7/06*
**U.S. Cl. 331—113R** **9 Claims**




A monostable or free-running transistor multivibrator is provided with semiconductor means for varying the period of conduction of one or both of the transistors forming the multivibrator in dependence upon a control voltage by varying the rate of discharge of the capacitor of the resistor-capacitor network whose time constant governs the period of conduction of the transistor. In one form of the invention the semiconductor means comprises an NPN transistor the collector-emitter path of which is in series with the capacitor of the associated resistor capacitor network, the control voltage being applied, directly or indirectly, to the base of the NPN transistor.

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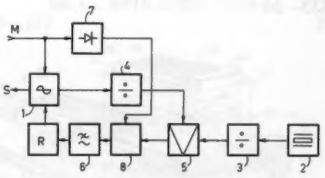
**3,587,003**
**AN AUTOMATIC FREQUENCY CONTROL SYSTEM FOR A FREQUENCY MODULATION CIRCUIT HAVING AN ASYMMETRIC INPUT SIGNAL**

**Jean Chastagnier, Brive, France, assignor to U. S. Philips Corporation, New York, N.Y.**

**Filed Sept. 30, 1969, Ser. No. 862,173**
**Claims priority, application France, Sept. 30, 1968, 168,121**
**Int. Cl. H03c** *3/06*
**U.S. Cl. 332—19** **5 Claims**

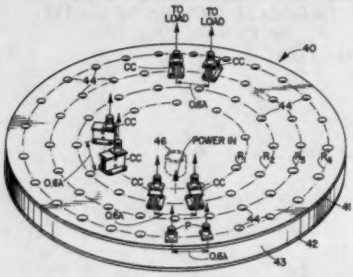



An automatic frequency control system for a frequency modulation circuit comprising a voltage-controlled, frequency-modulated oscillator having an asymmetric input signal and a reference oscillator coupled to a comparison detection circuit, which feeds back a control voltage compensated by the mean value of the asymmetry of the signal input to the voltage-controlled oscillator so that the circuit's output frequency is always at a harmonic of the frequency of the reference oscillator.

## 3,587,004
## CONTRADIRECTIONAL COUPLERS

Leonard I. Parad, Framingham, Mass., assignor to Sylvania Electric Products, Inc.

Filed Sept. 23, 1969, Ser. No. 860,339
Int. Cl. H01p 5/14
U.S. Cl. 333—10 15 Claims



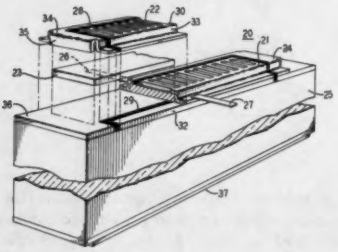

Contradirectional couplers for use in parallel-plate radial transmission line power dividers particularly suitable for use in phased array antenna systems. A plurality of contradirectional couplers are arranged in concentric rings in a first flat electrically conductive plate of a pair of parallel, spaced, flat, electrically conductive plates such that a power-coupling plate included in each coupler extends through an opening for a predetermined distance into the region between the two spaced plates. In a transmit mode of operation, a portion of the total power applied to the region between the spaced plates is coupled by each power-coupling plate included in each coupler, via a first electrical path through the coupler, to a corresponding load, for example, an antenna element. In the event any portion of the power coupled to a given antenna element is undesirably reflected back to the corresponding coupler, a major portion of such reflected power is absorbed by a load resistor provided in a second electrical path in the coupler. In a receive mode of operation, power received by the antenna elements from a target is coupled to the region between the parallel plates, via the first electrical paths through the couplers, and then applied to a suitable signal processing apparatus.

A coaxial transmission line power divider embodying contradirectional couplers of a modified form is also disclosed.

## 3,587,005
## TRANSDUCER ARRAY FOR ELASTIC WAVE TRANSMISSION

Irvin E. Fair, Treasure Island, Fla., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 3, 1968, Ser. No. 695,461
Int. Cl. H03h 7/00
U.S. Cl. 333—30 2 Claims

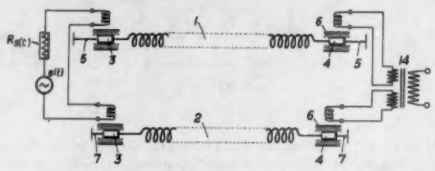



This application describes an improved transducer array for elastic wave transmission having reduced capacitance and reduced noise. In accordance with the invention, the ground and grating electrodes coextend on opposite sides of the transducer body only over the region coincident with the grating array. In addition, one or both electrodes are adapted to extend around the transducer body in a manner to shield it. By this means, the electrode capacitance and the generation of spurious, nondispersive signals are minimized. The improved structure also permits bonding of both contacts to their respective electrodes thereby producing a more reliable connection to the transducer.

## 3,587,006
## ARRANGEMENT FOR PRODUCING ARTIFICIAL REVERBERATION COMPRISING FREQUENCY DIVIDING MEANS

Bernhard Weingartner, and Werner Fidi, both of Vienna, Austria, assignors to Akustische u-Kino Gerate Gesellschaft m.b.H, Vienna, Austria

Filed Dec. 3, 1968, Ser. No. 780,802
Claims priority, application Austria, Dec. 7, 1967, A11100/67
Int. Cl. H03h 7/30, 9/30
U.S. Cl. 333—30 16 Claims

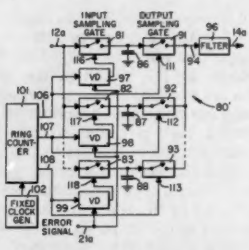



An artificial reverberation arrangement includes first and second transmission lines. Each transmission line includes a helical spring, adapted to transmit torsional vibrations at frequencies up to a predetermined limiting frequency, an actuating transducer connected to one end of the spring and a pickup transducer connected to the opposite end of the spring. The spring of the first transmission line is longer, and has a longer transit time and a lower limiting frequency, than the spring of the second transmission line. The actuating transducers are operable to impart torsional vibrations to the associated springs, and the pickup transducers are operable to convert torsional vibrations of the respective springs and to electric oscillations. The arrangement includes frequency dividing means operable to suppress transmissions above a predetermined division frequency through the first transmission line, and to suppress transmission at frequencies below the predetermined division frequency through the second transmission line.

## 3,587,007
## VARIABLE SAMPLE PERIODIC HOLD ELECTRONIC DELAY NETWORK

Gabor C. Temes, Los Altos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Aug. 27, 1969, Ser. No. 853,261
Int. Cl. H03h 7/36; H04b 3/04
U.S. Cl. 333—18 1 Claim




To achieve a variable time delay of an information signal wherein the amount of delay can be continuously varied in

response to a control signal, a plurality of paralleled sample and hold networks are arranged to receive the information signal and perform the following operations thereon. First, the magnitude of the information signal is sequentially sampled by a plurality of separate sampling gates, wherein each gate is provided with a separate storage capacitor for holding the sampled magnitude for the time interval between successive operations of the associated gates. The stored signal magnitudes are in turn sampled in succession by a plurality of separate output sampling gates wherein the resulting output signals therefrom are fed to a low-pass filter for eliminating high frequency signal components introduced by operation of the sampling gates. As the time duration between successive operations of the input and output sampling gates determines the amount of delay introduced into the information signal, a plurality of voltage controlled delay means are connected between associated sampling gates and are responsive to the instantaneous amplitude of the control signal to provide continuous adjustment of the gate timing intervals.

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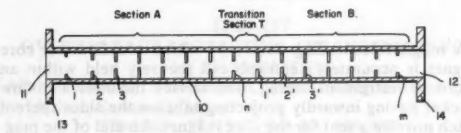
**3,587,008**

## MICROWAVE NARROW BAND-PASS FILTER

**George I. Tsuda, Fullerton, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.**

**Filed June 24, 1968, Ser. No. 739,494**
**Int. Cl. H03h** *7/10*; **H01p** *7/06*; **H03h** *7/08*
**U.S. Cl. 333—73 W** **3 Claims**




A very narrow band-pass microwave filter is described. Narrow bandwidth operation with low passband insertion loss is achieved by utilizing a cascaded combination of two band-pass filters coincidentally tuned in a unique manner. By providing independent adjustment of the two constituent filters of the cascaded combination arbitrarily narrow passband can be obtained over the operating frequency range.

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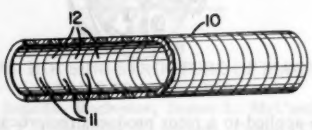
**3,587,009**

## ELECTROMAGNETIC FILTERS WHEREIN WAVEGUIDE WALLS COMPRISE ALTERNATE CONDUCTIVITY SECTIONS

**Lynden U. Kibler, Middletown, N.J., assignor to Bell Telephone Labratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 27, 1968, Ser. No. 787,479**
**Int. Cl. H01p** *1/20*
**U.S. Cl. 333—73W** **8 Claims**



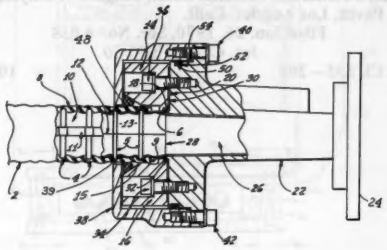

A high pass filter comprising a section of waveguide having alternate sections of different wall conductivity to produce a sharper cutoff and more linear phase propagation near cutoff. Low-pass, band-pass and band-reject filters are also described.

**3,587,010**

## SOLDERLESS GAS SEALED WAVEGUIDE CONNECTOR

**John James Walsh, Berkely Heights, N.J., assignor to Litton Precision Products, Inc., San Carlos, Calif.**

**Filed Jan. 12, 1970, Ser. No. 2,180**
**Int. Cl. H01p** *1/04, 3/14*; **F16l** *73/00*
**U.S. Cl. 333—95 A** **12 Claims**



In this solderless waveguide connector a clamp, formed by two complementary half-ring sections, defines a passage which collars the end portion of a section of elliptical waveguide; the waveguide being of the type which contains ridges which extend across the width and sides of the waveguide. The end of the waveguide section is formed at the middle of one such transverse ridge. A recessed seat or rim about the passage in the front face of the clamp abuts and seats the outer surface of a portion of a transverse ridge. A waveguide transition section with a microwave passage therethrough includes a protruding lip portion which surrounds the microwave passage. The transition is fastened to the clamp so that the protruding lip engages the inner surface of the aforementioned ridge portion of the waveguide so that the waveguide at its end is firmly clamped between the clamping means and the waveguide transition. A cap having a hollowed-out portion and an aperture or waveguide passage through its rear wall fits over the waveguide, is fastened at its front end to the waveguide transition, and within the hollow encloses the clamp. A first O-ring seal located inside and toward the rear of the cap tightly abuts each of the surfaces of the cap, the waveguide, and the back surface of the clamp. A second O-ring seal surrounds an outer rim surface of the transition section and abuts both the transition section and a front inner rim surface of the cap.

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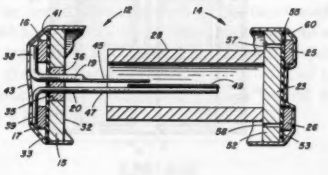
**3,587,011**

## REED SWITCH AND RELAY

**Edward A. Kurz, Flemington, N.J., assignor to Pyrofilm Corporation, Whippany, N.J.**

**Filed Jan. 9, 1970, Ser. No. 1,593**
**Int. Cl. H01h** *50/04, 51/28*
**U.S. Cl. 335—151** **15 Claims**



Reed relays, both normally closed and normally open circuits, are disclosed as comprising a novel switch section, a bobbin section and a coil means wound on the bobbin section. The switch section and bobbin section can be manufac-

tured independently and thereafter assembled so as to reduce manufacturing costs, facilitate calibration and expedite assembly. The reed relay is structured to provide a total shield around the reed elements to eliminate the effect of random environmental magnetic fields.

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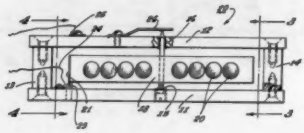
3,587,012

## MAGNETICALLY ACTUATED DETECTING AND SWITCHING DEVICE

Leonard Piekarski, Pomona, Calif., assignor to Smyth, Roston & Pavitt, Los Angeles, Calif.

Filed Jan. 26, 1970, Ser. No. 6,038
Int. Cl. H01h 36/00
U.S. Cl. 335—205 10 Claims



A car-detecting device is suggested in which a plurality of permanent magnets are symmetrically mounted on a support member to define a common magnetic axis. A shaft on the support member has a vertical axis intersecting transversely the magnetic axis. The lower end of the axis of the shaft is journaled in a needle bearing. The upper end of the shaft traverses a feedthrough bearing inhibiting pivoting of the support member around a horizontal axis. Electric current is fed to the support member through a contact engaging the upper end of the shaft. The support member is provided with a contact cooperating with a stationary contact or a pair of stationary contacts positioned in the angular deflection path of the contact on the support member to serve also as stop for limiting rotation and angle of deflection of the support member with the permanent magnets. This system is preferably used in that normally the magnets align themselves with earth's magnetic field without contact making as between the two contacts. The contacts operate on circuit means responding when a car deflects the permanent magnets from their alignment with the earth magnetic field.

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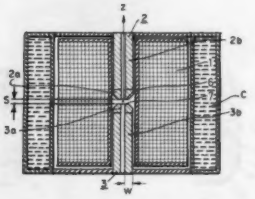
3,587,013

## MAGNETIC LENS DEVICE FOR CORPUSCULAR RAY APPARATUS OPERATING UNDER VACUUM

Isolde Dietrich, Munich; Reinhard Weyl, Assling, and Helmut Zerbst, Munich, all of, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 2, 1969, Ser. No. 821,245
Claims priority, application Switzerland, May 31, 1968, 8153/68
Int. Cl. H01f 7/00
U.S. Cl. 335—210 6 Claims



A magnetic lens device for corpuscular ray apparatus to operate under vacuum is equipped with a pair of tubular shielding cylinders of superconductive material coaxially surrounding the lens axis and spaced from each other along said axis. Cryogenic means are thermally connected with the cylinders, and lens windings surround the cylinders for generating a magnetic field. The respective cylinders terminate in end faces directed toward each other and defining between each other a lens gap in which the cylinders concentrate the field near the axis. According to the invention proper, the shielding cylinders comprise respective end portions of superconductive material of higher current-carrying capacity than the remaining portion of each cylinder, said end faces at said lens gap being formed by said respective end portions.

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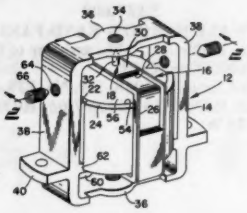
3,587,014

## POSITIONING DEVICE FOR INSTRUMENT ASSEMBLY

Julius Nador, Ingleside, Ill., assignor to Pneumo Dynamics Corporation, Cleveland, Ohio

Filed Jan. 13, 1970, Ser. No. 2,549
Int. Cl. H01f 7/08
U.S. Cl. 335—222 9 Claims



A magnet-positioning device by which a cylindrical core magnet is accurately centered and securely held within an electrical instrument casing. The device includes a hollow bracket having inwardly projecting tabs on the sides thereof which provide a seat for the core magnet. An end of the magnet supports a circular plate which has a pair of notches at opposite points in the edge thereof. These notches are engaged by a pair of aligned centering screws which penetrate the bracket sides at an elevation removed from the inwardly projecting tabs. The screws cam the core magnet against the seat tabs and axially align the core magnet within the bracket and thus within the instrument casing.

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3,587,015

## MAGNETIC ROTOR ASSEMBLY

William N. Mitchell, P.O. Box 11, Ochopee, Fla.

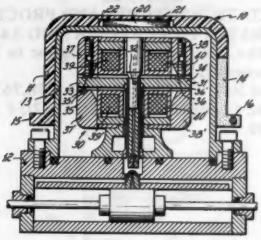
Filed Dec. 2, 1969, Ser. No. 881,449
Int. Cl. H02k 49/00
U.S. Cl. 335—227 9 Claims

Torque applied to a rotor produces reciprocation of magnetic assemblies in radial guides between limit positions approaching angularly spaced flux-conducting flange sections fixed to the frame on which the rotor is mounted. The magnetic assemblies are reciprocated in synchronized relation to rotation of the rotor and are provided with spaced pole faces magnetically bridged by the angularly spaced flux-conducting flange sections which form a circular track along which the radial guides travel.

## 3,587,016
## NULL ADJUSTER FOR MAGNETICALLY OPERATED TORQUE MOTORS

James L. Coakley, Camarillo, Calif., assignor to Abex Corporation, New York, N.Y.

Filed Jan. 29, 1970, Ser. No. 6,853
Int. Cl. H01f 7/08
U.S. Cl. 335—237 7 Claims

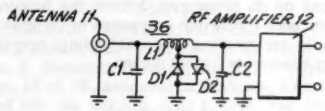


A device for adjusting the null current of a magnetically operated torque motor or force motor, preferably including a cylindrically shaped cap movably supporting a permanent magnet near the outside surface of the housing of the motor for angular adjustment about an axis substantially perpendicular to the axis of the armature.

## 3,587,017
## OVERVOLTAGE PROTECTING ARRANGEMENT FOR AN RF AMPLIFIER

Michio Kurusu, Kawasaki-shi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 27, 1967, Ser. No. 685,930
Claims priority, application Japan, Nov. 29, 1966, 41-78473
Int. Cl. H04b 1/12, 1/18
U.S. Cl. 325—362 4 Claims



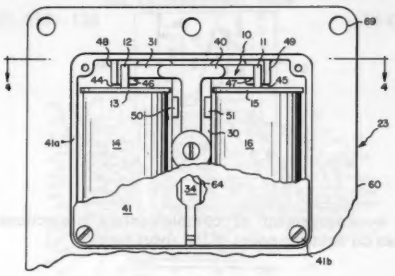

An overvoltage-protecting arrangement comprises a filter connected between an antenna and the input of an RF amplifier for providing impedance matching between the antenna and the amplifier. A diode is connected between the inductor of the filter at a point having an inductance $L=1/\omega C$ and a point at ground potential, $C$ being the capacitance between the antenna and ground, $\omega$ being $2\pi f$ and $f$ being the operating frequency of the arrangement. The diode has a zener diode characteristic and is switched to its conductive condition when the antenna supplies a high voltage signal to the filter thereby providing an impedance mismatch between the antenna and the filter.

## 3,587,018
## CORE AND HOUSING STRUCTURE OF MAGNETIC FLUX TRANSDUCER

Howard R. Jaquith, Rochester; James L. McCarthy, Chili, both of, N.Y.; Nathaniel B. Nichols, Colton, Calif., and Stanley C. Norton, Jr., Spencerport, N.Y., assignors to Sybron Corporation

Division of Ser. No. 409,884, Nov. 9, 1964, Pat. No. 3,480,854.
Filed July 30, 1969, Ser. No. 858,227
Int. Cl. H01f 27/02, 27/26
U.S. Cl. 336—92 6 Claims

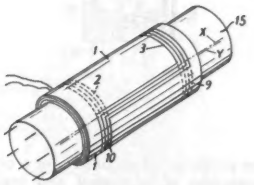
A square core is mounted in a housing with opposite legs only clamped to the core, one leg clamped by a cantilever spring which allows the core to expand in its plane under the influence of temperature. The legs are essentially single lamina, each of which is made up of a pair of Mumetal strips spotwelded together. The other legs have energizing, sensing and feedback coils thereabout, which coils are wholly supported by and within the housing.



## 3,587,019
## SCANNING COILS

Eric William Bull, Sunbury-on-Thames, and Alfred Marcos Sampeys, Gerrards Cross, both of, England, assignors to Electric & Musical Industries Limited, Hayes, Middlesex, England

Filed Aug. 22, 1968, Ser. No. 766,015
Claims priority, application Great Britain, Aug. 24, 1967, 38945/67
Int. Cl. H01f 5/00
U.S. Cl. 336—200 3 Claims



A circuit element, which is intended to be rolled into a cylindrical or like form to constitute a scanning coil assembly for a cathode-ray tube, is formed of a tapelike, flexible substrate with conductive patterns on either side thereof. Each pattern comprises a plurality of side by side conductors conforming to a longitudinally extending, substantially rectangular waveform, formed of alternate longitudinal and transverse portions. The longitudinal portions of the two waveforms are staggered with respect to each other, and respective conductors in the transverse portions are offset with respect to one another in the longitudinal direction so as to tend to reduce the self-capacitance of the element when wound to form a scanning coil assembly.

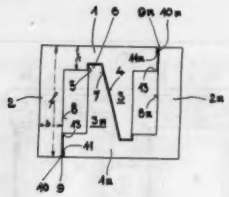
## 3,587,020
## TWO-PART CORE SHEET FOR TRANSFORMERS

Bruno Waasner, Bamberger Strasse 85, Forchheim, Germany

Filed July 1, 1969, Ser. No. 838,235
Int. Cl. H01f 27/26
U.S. Cl. 336—212 5 Claims

A core sheet for a transformer core formed from two complementary sheet parts. Each sheet part comprises a yoke, an

end limb and part of a central limb of the whole core sheet, and the two parts are positively locked together to form the



sheet by engagement of complementary projections and recesses on abutting edges of the sheet parts.

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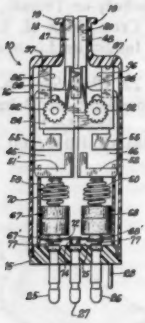
**3,587,021**

## LINE PROTECTOR FOR A COMMUNICATIONS CIRCUIT

**Bertram W. Baumbach, Arlington Heights, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.**

**Filed July 22, 1969, Ser. No. 843,714**
**Int. Cl. H01h** *37/76*
**U.S. Cl. 337—32** **16 Claims**



A plug-in line protector of small size for a communications circuit for protection of personnel and inside equipment against overvoltage, overcurrent, or both. An overvoltage of short duration applied to the protector arcs across an airgap to ground, while overvoltage of longer duration generates heat that melts a solder pellet permitting a spring-pressed contact member to establish a metallic path from line to ground. Following such action, the contact member and associated solder can be removed and replaced by a new member and solder pellet. The protector also contemplates an overcurrent protective means having a printed circuit insulating member movable from a normal inward position by a spring means to an outward position when subjected to an overcurrent condition. The movable printed circuit insulating member has a heat-responsive mechanism, including a ratchet wheel and pawl means, actuated by a heat coil to sense an overcurrent condition. When the printed circuit insulating member is moved from inward to outward position as a result of an overcurrent condition on an incoming line terminal of the protector, the incoming terminal is connected to ground through a metallic path and the outgoing terminal of the protector leading to inside equipment is disconnected from the circuit. The protector has visual means for locating readily a circuit exposed to an overcurrent condition, and also an auxiliary circuit for energizing an audible device to provide supplementary indication of the condition. The overcurrent protective means following an instance of operation readily may be reset by manually moving the printed circuit insulating member to inward position, thereby conditioning the protector for response to a subsequent overcurrent condition. In the illustrated embodiment, the protector has two incoming terminals and two outgoing terminals. An overvoltage of longer duration on either incoming terminal will melt the aforesaid solder pellet and provide a metallic path to ground for both incoming terminals, thereby maintaining the associated communications circuit in balanced condition.

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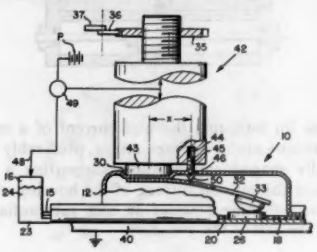
**3,587,022**

## THERMOSTATIC SWITCHES AND PROCESS AND APPARATUS FOR CALIBRATING SAME

**Charles John Hire, Pittsford, N.Y., assignor to Fasco Industries, Inc., Rochester, N.Y.**

**Filed Nov. 21, 1969, Ser. No. 878,767**
**Int. Cl. H01h** *37/20, 37/26, 37/54*
**U.S. Cl. 337—89** **6 Claims**



To calibrate a normally closed thermostatic switch of the type having a bimetallic switch arm fastened at one end to the inside of the switch housing, the switch is placed in an oven beneath a reciprocable calibrating tool with the switch arm connected in circuit with the tool operating means. When the switch reaches the temperature at which it is intended to open, the tool is lowered step by step so that a pair of projections on its lower end deform the housing at two spaced points until the switch arm snaps to its open position, simultaneously terminating the calibrating operation and deenergizing the tool actuating means.

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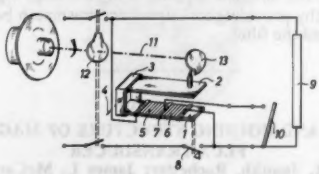
**3,587,023**

## POWER CONTROLS OF ELECTRICALLY HEAT APPLIANCES PARTICULARLY COOKING PLATES

**Gerhard Goessler, Moerikestrasse 46, Oberderdingen Wurttenburg, and Robert Kicherer, Im Bergfeld 33, Knittlingen Wurttenberg, both of, Germany**

**Filed Apr. 11, 1968, Ser. No. 720,713**
**Claims priority, application Germany, Apr. 14, 1967, E33790VIId/21h**
**Int. Cl. H01h** *37/12, 61/013;* **H05b** *1/02*
**U.S. Cl. 337—103** **10 Claims**



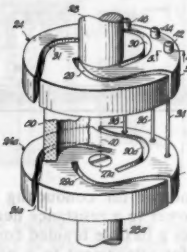
Power controls for electrically heated appliances, such as cooking plates. An energy control element in the power controls with a bimetallic member which has a control heating element and a contactor which influences the control heating element therein.

3,587,024

## HIGH VOLTAGE POWER VACUUM FUSE

Thomas E. Curtis, Centralia, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed Apr. 9, 1969, Ser. No. 814,736
Int. Cl. H01h 85/38
U.S. Cl. 337—273 8 Claims



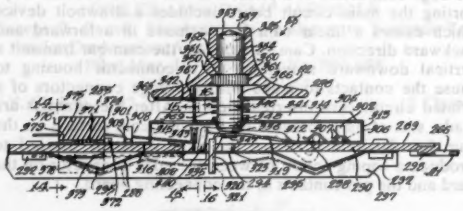
A power vacuum fuse for interrupting high voltage alternating currents. The fuse has one or more fusible, current-responsive elements spanning a pair of spaced electrodes adjacent the peripheries thereof. Leads to a high voltage line extend from the central regions of the electrodes, each of the electrodes being slotted from the central region to the periphery thereof to define a current path to each element which extends both radially outwardly and tangentially with respect to a central axis of the electrodes. The effect of the slotted electrodes is to apply a force to each element which expels it from between the electrodes upon melting of the element, such force having a tangential component which spins the arc established when all the elements are severed, thereby preventing the arc from swelling to preclude extreme volatilization of the elements and electrodes so that the circuit will be interrupted at the first natural current zero following severance of the elements.

3,587,025

## THERMOSTATIC CONTROL FOR ELECTRIC TOASTER

Sophocles J. Dokos, Oak Park; Chester H. Wickenberg, Elgin; Charles E. Swanson, Chicago, and Bernardas Gasparaitis, Chicago, all of, Ill., assignors to Sunbeam, Chicago, Ill.

Division of Ser. No. 821,578, May 5, 1969, Pat. No. 3,533,350, which is a division of application Ser. No. 668,597, Sept. 18, 1967, Pat. No. 3,472,154, filed Jan. 22, 1970, Ser. No. 4,867
Int. Cl. H01h 37/04, 37/20, 37/54
U.S. Cl. 337—333 10 Claims



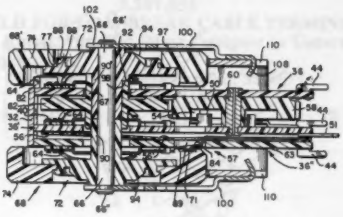
A thermostatic control for an electric toaster having a frame and a movable heat-sensing element and a bracket which supports an adjustable means. A resilient arm portion of the bracket forms a stop which limits the movement of the element. A reset means is pivotally mounted to the bracket for repositioning the element to its sensing portion. In one embodiment, the adjustable means consists of a hollow shaft which has a spring that projects through the shaft and engages the element so as to move the element into its sensing position. The lower end of the spring is depressible into engagement with the element by means of a button.

3,587,026

## DUAL CONTROL SYSTEM

George O. Puerner, and Charles L. Burns, both of Frankfort, Ind., assignors to P.R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Aug. 13, 1968, Ser. No. 752,286
Int. Cl. H01c 9/02, 9/08
U.S. Cl. 338—128 28 Claims



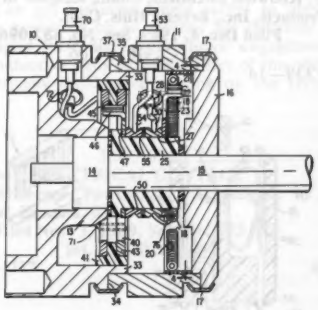
At least two rotating means are rotatably mounted on an axle in juxtaposition with variable resistance elements disposed between the rotating means. Support means including a base portion and having means extended from the base portion hold the rotating means and the variable resistance elements in spaced relation.

3,587,027

## COMBINED POTENTIOMETER AND SWITCHING STRUCTURE

Paul F. Gerwitz, West Covina, Calif., assignor to Spectrol Electronics Corporation, City of Industry, Calif.

Filed May 28, 1969, Ser. No. 828,618
Int. Cl. H01c 5/08
U.S. Cl. 338—172 4 Claims

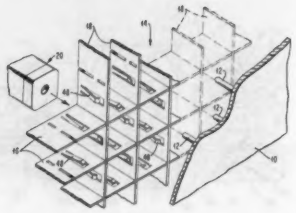


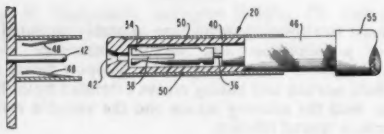
A combined potentiometer and switching structure including wiper contacts fixed to a shaft and having contacting engagement with an annular resistor and a pair of switching rings. The wiper contacts are located coincident, or in phase relation. The switching rings are each provided with an interrupted area, such areas are located in an arc complemental to the arc of the resistor and are circumferentially spaced apart a distance not greater than the length of the resistor contacting surface whereby, during rotation of the shafts, circuits connected to the switch rings are opened at different positions with respect to the resistor wiping contact. An annular supporting ring formed of electrical insulation material and provided with a central rib projecting from the inner surface thereof serves as a convenient mounting for the switch rings.

## 3,587,028
## COAXIAL CONNECTOR GUIDE AND GROUNDING STRUCTURE

Edward C. Uberbacher, Poughkeepsie, N.Y., assignor to International Business Machines Corporation

Filed Apr. 28, 1969, Ser. No. 819,873
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 8 Claims



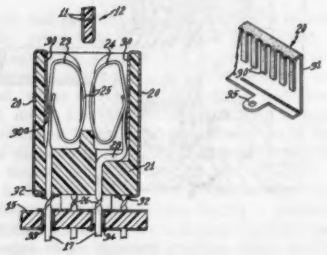


A grid structure is provided defining rows and columns of square openings therein which when connected to a circuit board provides a guide means for positively indexing coaxial wire terminals with contact pins extending from terminals on the circuit board. The grid structure also serves as a common grounding means for the shield conductor of each of the coaxial wires.

## 3,587,029
## RF CONNECTOR

Robert F. Knowles, Litchfield, Conn., assignor to Litton Precision Products, Inc., Beverly Hills, Calif.

Filed Dec. 4, 1969, Ser. No. 882,096
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 7 Claims

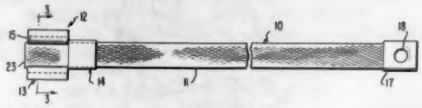


An RF connector for printed circuit boards, strip line cards, printed circuit cables and the like, particularly for micro-system packaging. The connector is adapted to be mounted on a baseboard or strip line card provided with a ground plane. A copper shield is mounted on the body of the connector with individual insulated tabs or fingers and one or more uninsulated tabs or fingers inserted behind the contacts of the connector. The lower edge of the shield is attached to a ground contact or directly to the baseboard or card. The impedance of a signal circuit can be varied by varying the length of the insulated tab that is in close proximity to the signal contact. Preferably the shield is provided with an insulating coating on one side so that electrical contact can be made with a ground contact of the connector by merely folding over the tip end of the grounding tab.

## 3,587,030
## TERMINAL CLAMP

Roger W. Ohnsorg, Niagara; Irving B. Ruppel, Jr., Tonawanda, and Michael E. Winger, Wilson, all of, N.Y., assignors to The carborundum Company, Niagara Falls, N.Y.

Filed Mar. 17, 1969, Ser. No. 807,615
Int. Cl. H01r *11/00, 15/12*
U.S. Cl. 339—28 7 Claims

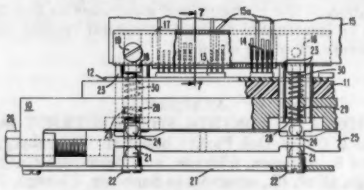


A terminal connector for conducting electrical current from a source of power to a resistance heating element. The connector comprises a flexible braided conductor with a terminal at one end for attachment to a power source and a spring clamp attached to the other end to intimately clamp the conductor directly against a resistance heating element and maintain the intimate contact as the heating element expands and contracts with changes in its temperature.

## 3,587,031
## ELECTRICAL CONNECTOR HOUSING WITH MEANS PRODUCING CONTACT WIPE

Theodore F. Flavin, Owego; John B. Harris, Endicott, and John R. Mankus, Endicott, all of, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,130
Int. Cl. H01r *13/54*
U.S. Cl. 339—75 MP 5 Claims



Electrical connector apparatus including a mechanically actuated linear cam bar adapted to provide contact closure and contact wipe for the contacting elements connecting to the edge connectors of a printed circuit board. A frame supporting the main circuit board includes a drawbolt device which causes a linear cam bar to move in a forward and backward direction. Cam surfaces on the cam bar transmit a vertical downward movement to a connector housing to cause the contacts to make with the edge connectors of a printed circuit card inserted therein. After the contacts are made, sets of pins operated by a second cam surface on the cam bar function to move the card vertically upward to produce a wiping action between the edge connector on the card and the pin contacts in the connecting board.

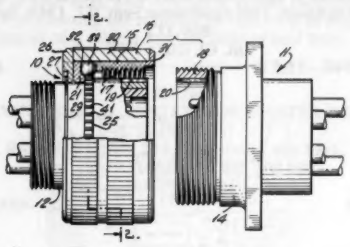
## 3,587,032
## SEPARABLE CONNECTOR WITH LOCKING MEANS

Richard W. Normann, Otego, N.Y., assignor to The Bendix Corporation

Filed Aug. 19, 1968, Ser. No. 753,565
Int. Cl. H01r *13/54*
U.S. Cl. 339—89 18 Claims

A separable connector having two parts selectively held together in aligned operative position by a connecting sleeve rotatably mounted upon one of the bodies and held against axial movement with respect thereto in at least the direction toward the other body. The connecting sleeve and the other body have mating formations whereby the two parts of the

connector are secured together upon the rotation of the sleeve in one direction relative to the other body. The present invention provides a selectively operable locking



means whereby the connecting sleeve may be secured from rotation with respect to said other part whereby to prevent fortuitous separation of the two connector parts.

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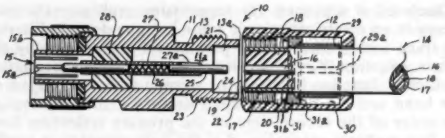
3,587,033

## QUICK CONNECTION COAXIAL CABLE CONNECTOR

William J. Brorein, Whippany, and Fred F. Polizzano, Allendale, both of, N.J., assignors to General Cable Corporation, New York, N.Y.

Filed Aug. 11, 1969, Ser. No. 848,904
Int. Cl. H04r *13/54*
U.S. Cl. 339—89 7 Claims



A quick connection connector for a coaxial cable consists of a body having a cylindrical portion with a well therein in which a squared off end of the cable is received against a stop in the well. With cable end thus received in the well, the outer conductor or sheath of the cable is in electrical contact with the stop, and a spring-loaded pin contact in the well makes contact with the end of the cable's center conductor. Clamp means on the connector is adapted to hold the cable end in the well.

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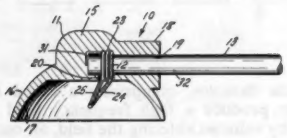
3,587,034

## COILED ANODE CLIP ASSEMBLY

George P. Canell, Meadville, Pa., assignor to National Teltronics Corporation, Yonkers, N.Y.

Filed Mar. 11, 1969, Ser. No. 806,085
Int. Cl. H01s *13/58*
U.S. Cl. 339—102 2 Claims



An anode clip assembly, including a resilient cap element of conventional type, and an improved clip associated therewith, the clip being formed to include a plurality of axially aligned convolutions, a leg extending from each end of the coil formed by said convolutions, and having means thereon engaging the anode recess in a cathode-ray tube, movement of the legs in a direction mutually apart from each other serving to enlarge the effective internal diameter of the convolutions, whereby an insulated conductor may be inserted axially therealong, to be gripped upon release of the legs, thereby eliminating the necessity of soldering the lead to the clip. Movement of the legs toward each other enables the diverging terminals thereof to clear the opening in the recess in the tube without releasing the resilient grip upon the conductor.

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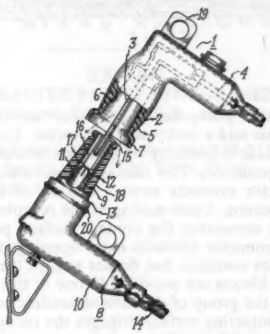
3,587,035

## GAS SHIELD FOR LOADBREAK CABLE TERMINATION

Edward J. Kotski, Pittsfield, Mass., assignor to General Electric Company

Filed Sept. 10, 1969, Ser. No. 856,671
Int. Cl. H01r *15/06*
U.S. Cl. 339—111 8 Claims



A high voltage electric cable termination module characterized by having a gas-confining flange mounted thereon adjacent an end of the module that is used to mount an exposed electrical conductor which is adapted to be engaged and disengaged with a second electrical conductor under load-break conditions. The gas-confining shield serves to prevent hot ionized gases generated by an electric arc between the two conductors upon their disengagement or engagement from forming a conductive path between either of the conductors and an electrically conductive coating on the termination module.

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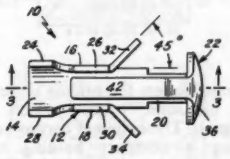
3,587,036

## ELECTRICAL CONTACT

Donald G. McGregor, Pawtucket, R.I., assignor to Electrix Corporation, Esmond, R.I.

Filed Nov. 3, 1969, Ser. No. 873,373
Int. Cl. H01r *9/08*
U.S. Cl. 339—217 4 Claims

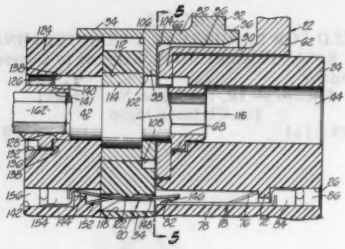


An electrical contact, formed in a one-piece metallic construction and having spaced fingers joined thereto in inclined relation that define locking elements for the contact when it is inserted in a bore of a contact block.

## 3,587,037
## LOW INSERTION FORCE CONNECTOR ASSEMBLY

John W. Anhalt, La Crescenta, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 25, 1968, Ser. No. 770,513
Int. Cl. H01r 13/54
U.S. Cl. 339—75 5 Claims

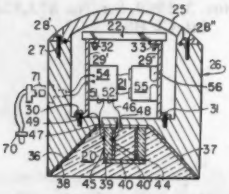


The invention comprises a connector assembly having a plug connector and a receptacle connector. Each of the connectors contains a plurality of contacts housed in openings within the connectors. The contacting surfaces of the receptacle connector contacts extend outside of the receptacle connector opening. Upon mating of the receptacle connector and the plug connector the contact surface portions of the receptacle connector contacts enter openings containing the plug connector contacts, but do not engage the plug connector contacts. Means are provided in one of the connectors to move one of the group of contacts in tandem so that the plug connector contacting surface engages the receptacle connector contacting surface. This moving means may be of the form of a plastic insert which houses the contacts and a camshaft housed therein, rotation of the camshaft causing a portion of the plastic insert to move the contacts contained in the plastic insert so that its contacting surfaces abut the contacting surfaces of the other connector.

## 3,587,038
## ULTRASONIC HOMING BEACON AND COMMUNICATION EQUIPMENT FOR UNDERWATER SWIMMERS

Frank Massa, Jr., Cohasset, Mass., assignor to Dynamics Corporation of America, Hingham, Mass.

Continuation of application Ser. No. 661,375, Aug. 17, 1967, now Patent No. 3,489,993. This application May 1, 1969, Ser. No. 820,906
Int. Cl. G01s 3/00
U.S. Cl. 340—6 R 9 Claims

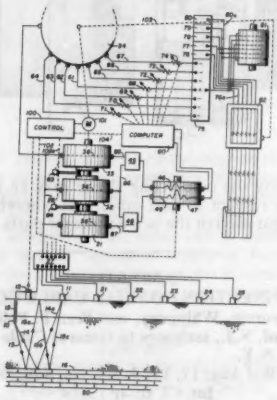


This is a homing system for guiding underwater swimmers to a moored ultrasonic beacon which sends out omnidirectional signals. The swimmer carries an ultrasonic compass comprising a compact housing that includes a directional receiving hydrophone and a signal strength indicating meter. Since the receiver is directional, the strength of the signal which it receives will, of course, be maximum when the receiver is pointing directly at the beacon. Therefore, the swimmer orients the axis of the receiver to obtain a maximum signal reading on the meter scale. Then, he swims in the direction in which the receiving hydrophone is pointing, and this takes him to the moored ultrasonic beacon.

## 3,587,039
## SECTION MULTIPLE ATTENUATOR

Milo M. Backus, and Earl C. Wisler, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of application Ser. No. 408,121, Nov. 2, 1964, now abandoned. This application Sept. 22, 1969, Ser. No. 860,112
Int. Cl. G01v 1/00
U.S. Cl. 340—15.5 R 4 Claims

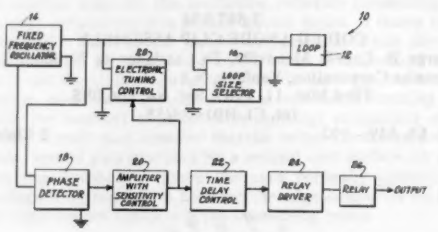


Disclosed is a process for suppressing multiple reflection energy in an electrical seismic trace by time domain filtering the trace with a filter whose parameters are defined by the matrix equation $Y_m=X^{11}Z$ where $Z$ is the cross-correlation coefficient function between the seismic trace undelayed on one hand and on the other hand delayed a time interval of the order of the record time of the primary reflection from the first multiple generator, $X$ is the auto-correlation coefficient function of the trace and $Y_m$ is the function designating filter weights.

## 3,587,040
## VEHICLE DETECTOR

George H. Fathauer, Decatur, Ill., assignor to Qonaar Corporation, Elk Grove Village, Ill.

Filed Aug. 12, 1968, Ser. No. 751,772
Int. Cl. G08g 1/01
U.S. Cl. 340—38 9 Claims




A vehicle detector, comprising a tuned inductive loop adapted to produce a high frequency field which will be disturbed by vehicles entering the field, an oscillator for supplying a high frequency energizing voltage to said loop, a phase detector for comparing the phase of said voltage across said loop with a reference voltage derived from said oscillator, said phase detector being adapted to produce a control signal when the phase of the voltage across said loop is disturbed by the entry of a vehicle into the field around the loop, an amplifier for amplifying said control signal, relay means connected to the output of said amplifier and operable in response to the amplified control signal, said relay means

including a time delay circuit for restoring the relay means to its original condition if the vehicle remains in the field of the loop for longer than a predetermined time interval, and electronic means connected to the output of said amplifier for returning said loop in response to slow changes in the inductance of said loop, said electronic means including a gate circuit for preventing the retuning of said loop in response to the movement of a vehicle into the field of said loop.

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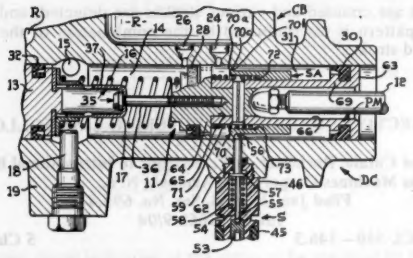
### 3,587,041
### WARNING SIGNAL SYSTEM FOR MASTER BRAKE CYLINDERS

**Glenn T. Randol, P.O.Box 275, Mountain Lake Park, Md.**

**Filed Aug. 7, 1968, Ser. No. 750,888**
**Int. Cl. G08b** *21/00;* **B60q** *9/00*
**U.S. Cl. 340—52** **7 Claims**




An electric warning apparatus for hydraulic brake systems on motor vehicles and the like, actuatable by known forms of single or tandem dual-piston brake actuators, and having a single switch device controllably related with one piston only to monitor abnormal piston travel due to pressure loss from the operably related brake system.

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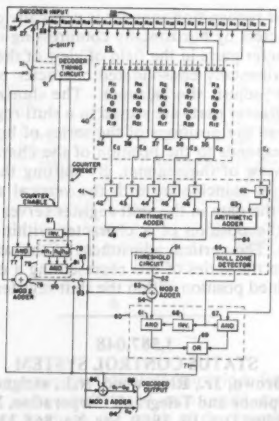
### 3,587,042
### RANDOM ERROR CORRECTING CODING AND DECODING SYSTEM HAVING INVERSION TOLERANCE AND DOUBLE CODE CAPABILITY

**Michael E. Mitchell, Syracuse, N.Y., assignor to General Electric Company**

**Filed July 3, 1969, Ser. No. 838,869**
**Int. Cl. G08c** *25/00;* **H04l** *1/10*
**U.S. Cl. 340—146.1** **10 Claims**



An improved error correcting coding and decoding system for reliable data transmission. During a first subcycle of decoder operation, estimator logic circuitry generates successive sets of estimator function bits from selected bits of a received code word, and a decision circuit generates successive test bits in accordance with a bit derived from a number of the estimator function bits. A modulo 2 adder compares the successive test bits with the corresponding received bits, and a counter circuit counts the number of disagreements. A disagreement count exceeding a predetermined number indicates that the received code word has become inverted, and circuitry then functions to correct for the inversion by either complementing the received code word before the second decoding subcycle or by complementing the output of the decoding decision circuit during the second subcycle. During the second decoding subcycle, the decision circuit generates successive decoded bits as determined from a majority of the estimator function bits and also from a code word bit if desired. In the event of a "tie" among the estimator bits, the indeterminate majority decision bit is replaced with the corresponding received bit. The encoding and decoding system may be used either for inversion tolerant coding and decoding of an appropriate code (such as the (21,11) code) or for noninversion tolerant coding and decoding of a related type of code (such as the (21,12) code).

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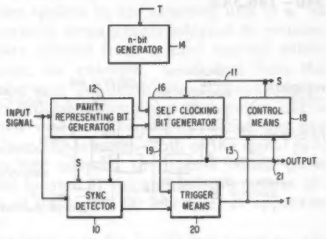
### 3,587,043
### CHARACTER PARITY SYNCHRONIZER

**Carl Michael Mengani, Brooklyn, N.Y., assignor to RCA Corporation**

**Filed Apr. 29, 1969, Ser. No. 820,211**
**Int. Cl. H04l** *7/00;* **G08c** *25/00*
**U.S. Cl. 340—146.1** **5 Claims**




Character synchronizing bits having a predetermined binary level are generated from a single serial stream of binary parity encoded characters, and once having been generated, continue to be produced independent of the encoded characters for thereafter synchronously processing the encoded characters. Timing disparities between the synchronizing bits and the encoded characters are rapidly detected and a new stream of synchronizing bits is generated when loss of synchronization is manifested.

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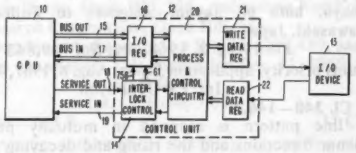
### 3,587,044
### DIGITAL COMMUNICATION SYSTEM

**Harold E. Jenkins, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed July 14, 1969, Ser. No. 841,633**
**Int. Cl. G06f** *11/00;* **G08c** *25/02*
**U.S. Cl. 340—146.1** **9 Claims**




System for the transfer of data through a medium having a significant delay and for interlocking the data transfers to assure accurate completion thereof. A transmission means

transmits data as a string of blocks to a receiving means. A first signal is separately transmitted to the receiving means each time a block of data is transmitted. At the receiving means, a second signal is generated upon coincident detection of receipt of a first signal and a block of data. The second signal is then transmitted back to the transmission means. At the transmission means, a delay means is set to count machine cycles to a predetermined time after the first signal is transmitted. The delay means then enables response circuitry of expect receipt of a second signal in the following machine cycle, the signals continuing at the machine cycle rate. Another counter is set to the number of blocks of data to be sent and decrements as each second signal is received. When the value of the second counter is equal to that of the delay counter, no more data is transmitted and the remaining received second signals are checked. If the counter is decremented thereby to zero and no more second signals are received at the transmission means, the correct amount of data was received by the receiving means.

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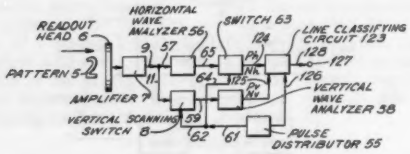
**3,587,045**

## SYSTEM FOR EXTRACTING FEATURES OF LINES OF A PATTERN

**Nobuyuki Tanaka, Yokohama-shi, and Naoki Morimoto, Kawasaki-shi, both of, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Nov. 3, 1967, Ser. No. 680,562**
**Claims priority, application Japan, Nov. 10, 1966, 41/74011**
**Int. Cl. G06k 9/10**
**U.S. Cl. 340—146.3AE** **1 Claim**




A pattern is moved with respect to a plurality of linearly positioned detecting elements. A first circuit connected to the detecting elements derives the output signals of the detecting elements as scanning signals for the direction of movement of the pattern. A switch circuit coupled to the detecting elements provides scanning for a direction at right angles to the direction of movement of the pattern by cyclically switching the scanning signals at high speeds. Wave analyzers are connected to the first circuit and to the switch circuit for detecting the increases and decreases of the scanning signals. A second circuit coupled to the wave analyzer combines the output signals of the wave analyzer and determines the slopes of lines constituting the pattern.

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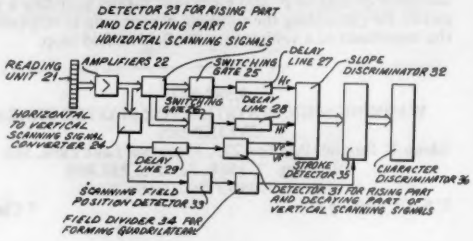
**3,587,046**

## SLOPE DETECTING PATTERN RECOGNIZING SYSTEM FOR DETERMINING A LINE PATTERN

**Nobuyuki Tanaka, Yokohama-shi, and Naoki Morimoto, Tokyo, both of, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Aug. 2, 1968, Ser. No. 749,843**
**Claims priority, application Japan, Aug. 8, 1967, 42/51146**
**Int. Cl. G06r 9/00**
**U.S. Cl. 340—146.3** **8 Claims**

A line pattern is scanned in mutually perpendicular coplanar directions and the rising and decaying parts of the scanning signals produced are detected in each of the directions to provide rising and decaying signals. The rising and decaying signals are used to produce line detecting signals in accordance with the slopes of the lines of the line pattern. A field is detected in which the line pattern exists within the field of the scanning signals and a plurality of observing fields are set within the field. The line detecting signals classified by the slopes of lines within the observing


DETECTOR 23 FOR RISING PART AND DECAYING PART OF HORIZONTAL SCANNING SIGNALS
READING UNIT 21
AMPLIFIERS 22
SWITCHING GATE 25
DELAY LINE 27
SLOPE DISCRIMINATOR 32
SWITCHING GATE 26
DELAY LINE 28
HORIZONTAL TO VERTICAL SCANNING SIGNAL CONVERTER 24
DELAY LINE 29
STROKE DETECTOR 35
CHARACTER DISCRIMINATOR 36
SCANNING FIELD POSITION DETECTOR 33
DETECTOR 31 FOR RISING PART AND DECAYING PART OF VERTICAL SCANNING SIGNALS
FIELD DIVIDER 34 FOR FORMING QUADRILATERAL

fields are counted and various strokes are detected, and the line pattern is discriminated by the combination of the detected strokes.

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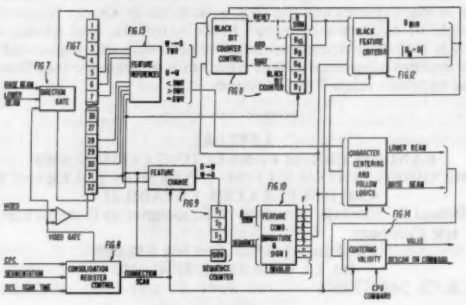
**3,587,047**

## SELECTIVE CHARACTER CENTERING LINE FOLLOW LOGICS

**Alfred Cutaia, Rochester, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 3, 1968, Ser. No. 695,474**
**Int. Cl. G06k 9/04**
**U.S. Cl. 340—146.3** **5 Claims**



A character recognition scanner is vertically centered on a line of characters by horizontally compressing or consolidating the character parts in the field of view of the scanner and using the horizontally consolidated character parts as a cue to vertically adjust the scanner. The horizontally consolidated character parts are stored in a shift register by a series of bits and the positions of the series of bits in the shift register corresponds to the position of the character parts in the field of view of the scanner. By shifting the data in the shift register in coincidence with the vertical adjustment of the scanner, the data in the shift register serves as a continuous cue of the position of a character within the adjusted field of view. The vertical adjustment of the scanner is then stopped when the series of bits representing a character is at a predetermined position within the shift register.

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**3,587,048**

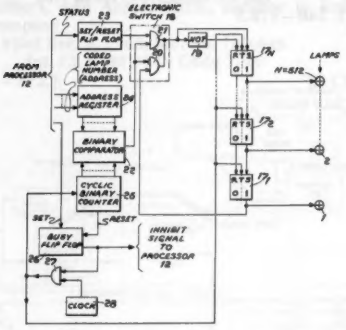
## STATUS CONTROL SYSTEM

**Thomas G. Brown, Jr., Ridgewood, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.**

**Filed Oct. 10, 1969, Ser. No. 865,336**
**Int. Cl. H01l 5/00; H04q 1/00**
**U.S. Cl. 340—147** **10 Claims**

N lamps, each having a different coded address, are each coupled to a different one of N flip-flops connected in tandem. The address of a particular lamp is stored in a register.

A clock signal controls the binary counter and synchronously the shifting of the state of each flip-flop. A comparator is coupled to the register and the counter producing a "0" output when the stored address and the count are unequal and a "1" output when the stored address and count are equal. The latter output occurs when the present state of the flip-flop associated with the addressed lamp appears in the last flip-flop. An electronic switch responds to the "0" output to connect the flip-flops in a loop and to the "1" output to inject a




coded signal indicative of the status to be assumed by the addressed lamp into the first flip-flop and to control the state thereof by the injected coded signal. The shifting of the status of the flip-flops continues during the remaining counts of the counter. At the end of the count, the state induced by the status signal in the first flip-flop is present in the flip-flop associated with the addressed lamp and will accordingly control the status of this lamp. Different variations of the above basic system are also disclosed.

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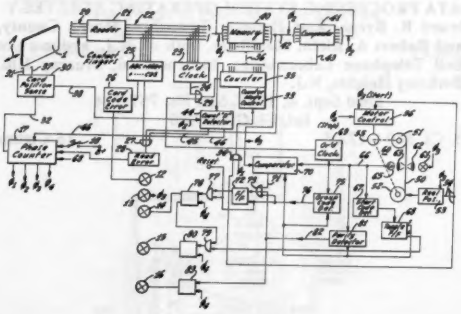
**3,587,049**

## CREDIT CARD TESTING EQUIPMENT

**James P. Nicklas, Woodlands Hills, Calif., assignor to Electronic Arrays, Inc., Woodland Hills, Calif.**

**Filed June 17, 1968, Ser. No. 737,626**
**Int. Cl. H04q** *9/00*
**U.S. Cl. 340—149** **8 Claims**



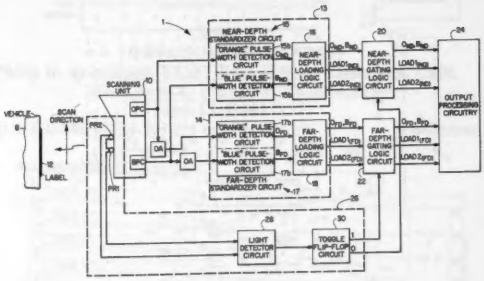
The testing equipment disclosed provides for bidirectional reading of a code word stored on a credit card in machine readable form to check the result of the first reading against the second reading. The code read is stored in a memory and is compared with all code words on a film, on a character for character and code word for code word basis. Detection of the code word on the card as one of those on the film is indicated.

**3,587,050**

## CODED OBJECT IDENTIFICATION SYSTEM AND SIGNAL PROCESSING MEANS

**Anthony C. Durante, Burlington, Mass., assignor to Sylvania Electric Products, Inc.**

**Filed Sept. 2, 1969, Ser. No. 854,379**
**Int. Cl. H04q** *1/18*
**U.S. Cl. 340—149** **14 Claims**




A coded object identification system having a relatively wide depth of field. A scanning unit is arranged to scan coded retroreflective labels affixed to objects, such as trucks, moving past the scanning unit and presenting labels to be "read" by the scanning unit from within a range of distances of 7—13 feet from the scanning unit. Coded pulses derived as a result of scanning a label within the 7—13 foot range of distances are applied by the scanning unit to a "near-depth" signal processing arrangement adapted to process optimally coded pulses derived from a label located within a "near-depth" range, for example, 7—10 feet from the scanning unit, and also to a "far-depth" signal processing arrangement adapted to process optimally coded pulses derived from a label located within a "far-depth" range, for example, 10—13 feet from the scanner. Both of the signal processing arrangements are adapted to process coded pulses derived from a label located at the approximate center of the 7—13 foot range of distances, for example, at approximately 9.5—10.5 feet.

While the label is in the 7—10 foot range or, alternatively, in the 10—13 foot range, the coded signals from the appropriate signal processing arrangement (or both, if the label is at approximately 9.5—10.5 feet) is gated to additional signal processing circuitry, for further processing, by means of an electro-optical arrangement including a pair of photoresponsive devices arranged to be illuminated during each scan cycle by light from the scanning unit, a light detector circuit connected to the photoresponsive devices, and a toggle flip-flop circuit operable under control of the light detector circuit to enable in alternation gating logic circuits provided in the "near-depth" and "far-depth" data processing channels.

The additional signal processing circuitry includes data storage circuitry, and a parity checking apparatus and a label data recognition arrangement for rejecting any incorrect or invalid data caused to be gated into the data storage circuitry by the electro-optical arrangement.

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**3,587,051**

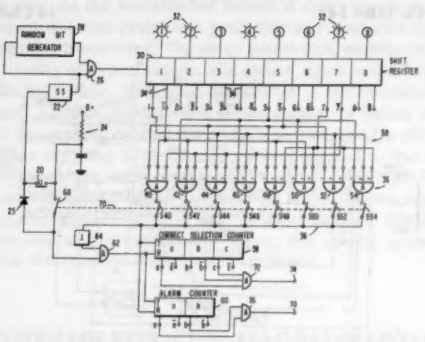
## ELECTRONIC COMBINATION SWITCHING DEVICE

**John Morris Hovey, Oxon Hill, Md., assignor to North American Research Corporation, Oxon Hill, Md.**

**Continuation-in-part of application Ser. No. 791,439, Jan. 15, 1969, now abandoned. This application Dec. 11, 1969, Ser. No. 884,440**
**Int. Cl. H04q** *3/02*
**U.S. Cl. 340—164 R** **11 Claims**

An electronic combination switching device for storage safes, credit card verification, etc. having a randomly varying operational sequence such that unauthorized persons cannot determine how to operate the device by observing an authorized person operate it. A random bit word is loaded into a storage register having preselected stages connected to

a manually operable decoder. The authorized user observes the condition of the various register stages by indicator lights, and, having knowledge of the preselected stages, or combination, actuates the decoder to produce a raised output. Each




proper actuation is accumulated in a counter and a new random word is loaded into the register after each actuation. The counter yields an output after a predetermined number of proper actuations. Improper actuations reset the counter and operate an alarm.

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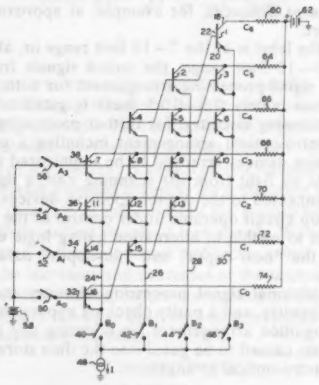
**3,587,052**

## TRANSISTOR MATRIX

**Michael H. Metcalf, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.**

**Filed Oct. 28, 1968, Ser. No. 770,910**
**Int. Cl. H04g** *3/00*
**U.S. Cl. 340—166** **13 Claims**



In a matrix of transistors, base and emitter elements are interconnected in first and second groups wherein each transistor is identified by a unique combination of input connections with respect to the first and second groups. Transistors, the combined input values of which add to the same sum, have common collector output means for providing an adding function. In an integrated circuit construction, the common collector output means comprise adjoining isolation regions, wherein several transistors may be disposed along each isolation region. Means interconnecting transistor emitters in first groups comprise conductors connecting the emitters of no more than one transistor in each isolation region. Dual base terminals permit conductors, which comprise the means to interconnect the transistor base terminals in second groups, to extend in between first group conductors, and from a transistor in one isolation region to a transistor in another isolation region, avoiding crossunders and the like.

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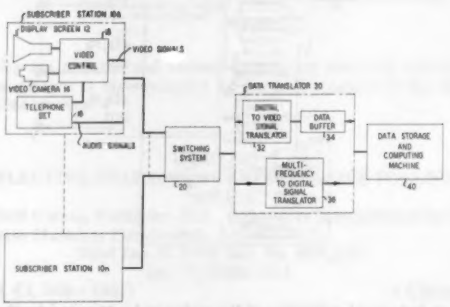
**3,587,053**

## AUDIO VISUAL INFORMATION PROCESSING AND COMMUNICATION SYSTEM

**Joseph J. Horzepa, Colts Neck; James J. Mansell, Fair Haven, and Robert L. Simms, Jr., Colts Neck, all of, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed June 10, 1968, Ser. No. 735,747**
**Int. Cl. G06f** *3/14;* **H04n** *1/00*
**U.S. Cl. 340—172.5** **5 Claims**




A visual communication system comprising a telephone switching system, a plurality of video telephone stations each connected to the system, and a data storage and computing machine also connected to the system via a data translator. A connection from any video telephone station may be established to any other station or to the data storage and computing machine by "dialing" or keying certain codes on a telephone set of the video station. After establishing a connection to the data storage and computing machine, instructions to the machine are keyed on the telephone set and transmitted via the system and data translator to the machine. In response thereto, the machine generates output signals which are applied to the data translator and there converted to video signals to be transmitted via the system to the originating station for display on the station's video set.

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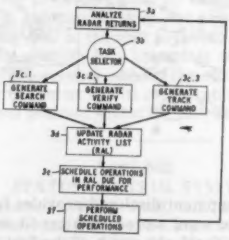
**3,587,054**

## SCHEME ALLOWING REAL TIME ALTERATION OF A DATA PROCESSING SYSTEM OPERATING STRATEGY

**Edward R. Byrne, East Hanover Township, Morris County, and Robert A. Rieth, Mendham, both of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed Sept. 6, 1968, Ser. No. 757,944**
**Int. Cl. G06f** *9/00*
**U.S. Cl. 340—172.5** **16 Claims**




A computer-controlled phased-array radar system whose strategy for scheduling operations for performance utilizes two priority hierarchies is disclosed. Each operation is represented by a format that includes a desired high rate of

performance parameter and a lower acceptable rate of performance parameter. With a light load, operations are scheduled for performance at their respective desired rates on the basis of a low order priority hierarchy. As the load increases, operations not being scheduled at their desired rates are scheduled at the lower acceptable rates on the basis of a higher priority hierarchy.

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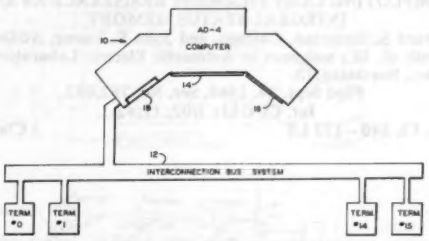
**3,587,055**

## PLURAL OPERATOR-STATION TIME-SHARED ANALOG COMPUTER APPARATUS

**Elmer G. Gilbert, Ann Arbor, Mich., assignor to Reliance Electric Company**

**Filed Dec. 2, 1968, Ser. No. 780,446**
**Int. Cl. G06f 3/02; G06g 7/06**
**U.S. Cl. 340—172.5** **23 Claims**




A plurality of users situated at a plurality of remote terminal units are enabled to utilize a general-purpose analog computer in a time-sharing arrangement allowing each user to obtain solutions of his own versions of one or several basic problems which are simultaneously patched on the analog computer. An addressing system services the remote terminal units sequentially, and the analog computer runs one or more problem solutions when a given terminal unit is being serviced using coefficient data and problem configuration data established by the user at the given terminal unit. Both analog and digital arrangements for transmitting coefficient data from each terminal unit to the analog computer are illustrated.

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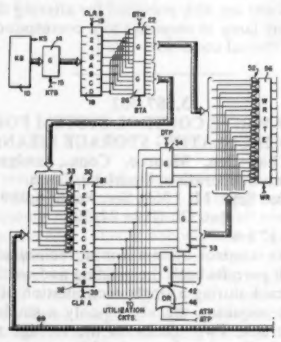
**3,587,056**

## PROGRAM LOAD SYSTEM FOR A DATA RECORDER

**Walter Banziger, Utica, and Donald C. Smith, Mohawk, both of, N.Y., assignors to Mohawk Data Sciences Corporation, Herkimer, N.Y.**

**Filed Apr. 1, 1969, Ser. No. 812,126**
**Int. Cl. G06f 7/00; G11b 13/00**
**U.S. Cl. 340—172.5** **9 Claims**



A keyboard-to-tape data recorder with a magnetic core memory to buffer data in the key-to-tape transfer cycle. The memory is provided with a section for storing working data to be recorded and a section for storing program control data which enables the recorder to automatically execute subroutines such as duplicate, skip, etc. The memory loading cycle operates to inhibit keyboard access to the program memory section during normal data entry cycles but permits program data to be added, deleted or changed via the keyboard upon actuation of a special control switch. The program entry cycle enables single-keystroke entry of program data and insures that program data fields adjacent to those being altered are not disturbed.

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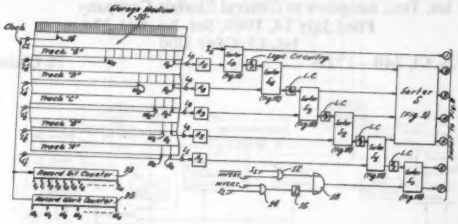
**3,587,057**

## DATA SORTING SYSTEM

**Philip N. Armstrong, 17331 Keegan Way, Santa Ana, Calif.**

**Filed June 4, 1969, Ser. No. 830,225**
**Int. Cl. G06f 7/22**
**U.S. Cl. 340—172.5** **14 Claims**



A data sorting system for multibit binary records is provided which is capable of responding to a control field in each of the records in order to sort the records into an ascending or descending progression. The sorting system to be described has the feature that it is capable of sorting a file of the aforesaid records which contains more records than the capacity of the sorting system itself. The system is controlled so that the file is repeatedly circulated therethrough until a complete sort is achieved, with the capacity of the system being reduced for each successive pass so that optimum efficiency is maintained at all times.

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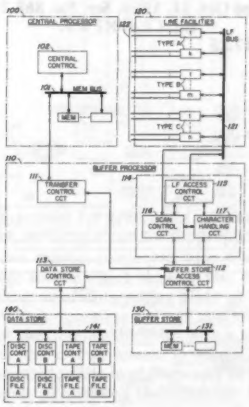
**3,587,058**

## DATA PROCESSING SYSTEM INPUT-OUTPUT ARRANGEMENT

**Thomas T. Butler, Downers Grove; Kenneth P. Kretsch, Sr., Wheaton; Sylvester M. Neville, Naperville, and George W. Smith, Jr., Naperville, all of, Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed June 4, 1969, Ser. No. 830,343**
**Int. Cl. G06f 3/00**
**U.S. Cl. 340—172.5** **20 Claims**




A store and forward message switching system in which an auxiliary processor is employed to communicate with data

lines having various data rates and data formats, and with disc and tape bulk data storage units. The data lines are terminated on data line buffers which are serviced by cooperation of two control circuits in the auxiliary processor operating on an overlap basis. Data is transferred between a fast access memory and the bulk data storage units under control of sequencing circuits in the auxiliary processor, and the function of servicing data line buffers is performed contemporaneously with the function of transferring data between the fast access memory and the bulk data storage units.

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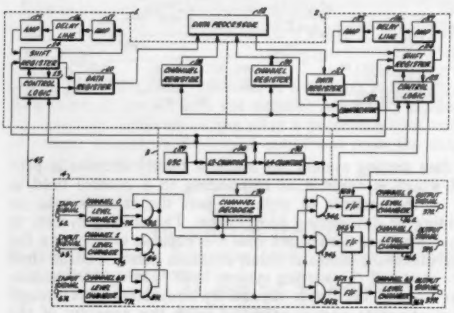
**3,587,059**

**APPARATUS FOR TRANSFERRING DATA FROM A PLURALITY OF LOW-SPEED DEVICES TO A HIGH-SPEED PROCESSOR**

**James A. Kennedy, Phoenix, Ariz., and John F. Couleur, Dallas, Tex., assignors to General Electric Company**

**Filed July 14, 1969, Ser. No. 841,374**
**Int. Cl. G06f** *3/00*
**U.S. Cl. 340—172.5** **16 Claims**



The apparatus for transferring data between a high-speed processor and a plurality of low-speed devices includes a data recirculator connected between the data processor and a plurality of peripheral devices. A timing module supplies signals which causes the data from the plurality of peripheral devices to be sampled sequentially and to be stored in the data recirculator until the register is full of data. The data is then transferred in parallel to the the data processor.

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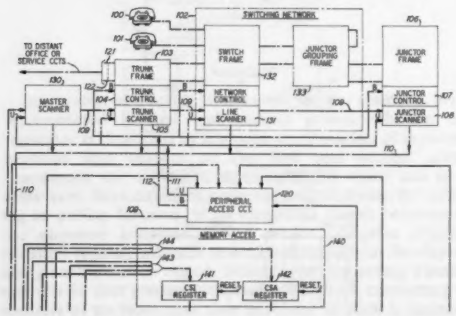
**3,587,060**

**SHARED MEMORY DATA PROCESSING SYSTEM**

**Thomas M. Quinn, West Chicago, and Frank S. Vigilante, Naperville, both of, Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed Oct. 21, 1969, Ser. No. 868,196**
**Int. Cl. G06f** *9/00*
**U.S. Cl. 340—172.5** **12 Claims**



A telephone switching system which comprises a program controlled main processor and a wired logic input-output arrangement for collecting and registering input information obtained from the lines and trunks served by the system and for transmitting control signals on the trunks and data to other controlled output units. The processor includes a timing arrangement which defines short repetitive time cycles (each cycle is 1.251 milliseconds long). During a first fixed portion of each time cycle the program controlled unit and the input-output logic bid for access to a shared bulk memory and to peripheral units; and during this first period of time the program controlled unit enjoys a priority status. During the remaining portion of each time cycle the priority shifts to the wired logic input-output arrangement to assure that it completes a prescribed amount of work during each time cycle.

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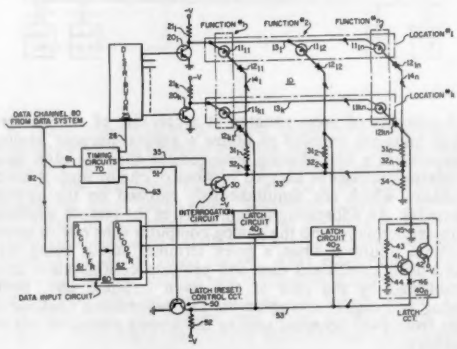
**3,587,061**

**TIME-SHAPED LAMP CONTROL APPARATUS EMPLOYING LAMP FILAMENT RESISTANCE AS AN INTEGRAL STATUS MEMORY**

**Edward S. Bieszczad, Chicago, and John S. Young, Addison, both of, Ill., assignors to Automatic Electric Laboratories, Inc., Northlake, Ill.**

**Filed Sept. 24, 1968, Ser. No. 762,082**
**Int. Cl. G11c** *5/02, 11/42*
**U.S. Cl. 340—173 LT** **2 Claims**



Time sharing techniques are applied to control the operation of a plurality of lamps which report operational conditions of the system in which they are employed. The lamps, which may be physically located in separate groups, are electrically connected in a matrix along coordinates of lamp location and system operational condition (function reported). The hot or cold filament resistance of each lamp, which serves as an integral status memory, is sampled by time-sharing circuits which determine and maintain the sampled status of a lamp. Circuits are also provided for altering the ON-OFF condition of any lamp in response to a corresponding change in system operational condition.

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**3,587,062**

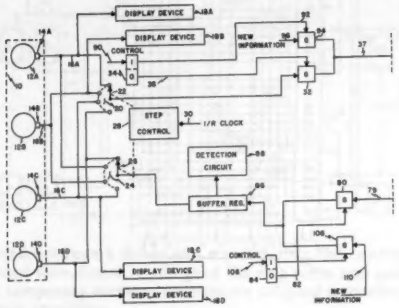
**READ-WRITE CONTROL SYSTEM FOR A RECIRCULATING STORAGE MEANS**

**Dixson Teh-Chao Jen, Monroe, Conn., assignor to The Bunker-Ramo Corporation, Stamford, Conn.**

**Filed Sept. 11, 1969, Ser. No. 856,989**
**Int. Cl. G11c** *21/00*
**U.S. Cl. 340—173 A** **14 Claims**

A read-write control system for a recirculating storage medium which permits both the reading and writing of information on a track during a single recirculation of the storage medium while requiring the use of only a single read-write head on the track. Two tracks on the storage medium are designated as buffer storage tracks. Means are provided for storing information from a selected track onto a first of the buffer storage tracks, the storing of information from the first buffer storage track onto a second buffer storage track, and for storing information from the second buffer storage track back onto the selected storage track. The storing means are

configured relative to the buffer storage tracks in a manner such that the time between the reading of a given piece of information from the selected track and the restoring of the given piece of information in the selected track is normally equal to the time required for one revolution of the storage medium. At least one of the storing means includes means for making the information available for reading as it is being




written. Also, at least one of the storing means includes means for the selective storing of new information in place of information read from the preceding track. At least one of the storing means should also include a register means the contents of which may be detected. By varying the size of the register means, the information may be effectively shifted in one direction or the other.

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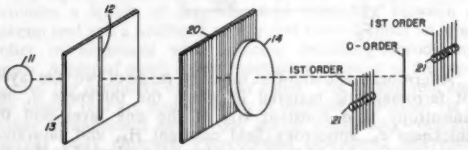
## 3,587,063
## SYSTEM FOR RETRIEVING DIGITAL INFORMATION

**Robert L. Lamberts, and George C. Higgins, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Division of Ser. No. 306,057, Sept. 3, 1963, Pat. No. 3,312,955, and a continuation of Ser. No. 601,796, Dec. 14, 1966, abandoned. This application Oct. 13, 1969, Ser. No. 871,728**
**Int. Cl. G11c *13/04***
**U.S. Cl. 340—173** **6 Claims**

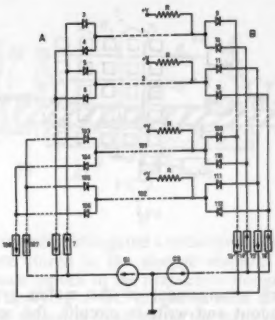



The high resolution of photographic film is used for information recording and retrieval by forming an image which can be accurately read out in spite of small pieces of dirt or scratches on the film. This is accomplished by exposing the film to a composite pattern which comprises a plurality of uniform gratings with different intervals, each representing the presence of a respective "bit" of an item of information. When the developed image of such a composite pattern is illuminated with monochromatic light, each of the first order spectra that is formed corresponds to a respective one of the uniform grating patterns. Since the composite pattern comprises the sum of the uniform gratings having different grating intervals, the presence or absence of a given first order spectrum can be used to represent the presence or absence of a corresponding binary bit.

## 3,587,064
## SELECTION CIRCUIT FOR MEMORY LINES

**Ettore Stanghellini, Milan, Italy, assignor to Olivetti-General Electric S.p.A., Caluso (Turin), Italy**

**Filed Nov. 3, 1966, Ser. No. 591,843**
**Claims priority, application Italy, Nov. 3, 1965, 24373/65**
**Int. Cl. G11c *7/00***
**U.S. Cl. 340—174** **4 Claims**




A selection circuit is disclosed for selectively sending pulses of opposite polarity to a two-terminal load element selected from a multiplicity of such elements and which circuit is particularly suitable for magnetic core memory line selection. Through the use of oppositely poled diode pairs at each end of a line and of transformer coupling, stray current transients are suppressed and the number of pulse generators and selecting switches is reduced to a minimum.

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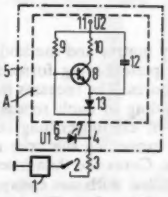
## 3,587,065
## CIRCUIT ARRANGEMENT FOR GENERATING STEEP FLANKED PULSES TO A MAGNETIC MEMORY

**Rudolf Kuntze, Otterfing, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed Mar. 4, 1968, Ser. No. 710,180**
**Claims priority, application Germany, Mar. 10, 1967, P 15 12 467.1**
**Int. Cl. G11c *7/00, 11/02*; H03k *3/53***
**U.S. Cl. 340—174** **5 Claims**

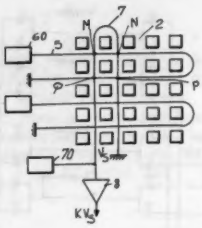



A circuit arrangement for generating current impulses with very steep flanks, utilizing a current superimposed on that of a current impulse source connected to a time-dependently controlled voltage source which supplies said current impulse source, the buildup operation taking place at the load point with a relatively high operating voltage and subsequently for the remainder of the impulse duration with a lower operating voltage covering the circuit losses, in which a capacitor is operatively connected to the load point and to a charging circuit for operatively connecting the capacitor to a source of relatively high voltage, the charging operation being controlled by a switch means which is operatively connected to and controlled in dependence upon the operating conditions at such load point.

## 3,587,066
## MAGNETIC MEMORY

Daniel Gibacier, and Tran Van Khai, both of Paris, France, assignors to CSF Compagnie Generale De Telegraphie Sans Fil, France

Filed Mar. 26, 1968, Ser. No. 716,091
Claims priority, application France, Apr. 4, 1967, 101,466
Int. Cl. G11c 5/02, 7/00
U.S. Cl. 340—174 4 Claims

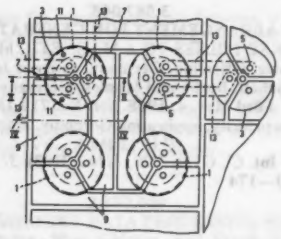


A memory arrangement of the matrix type having associated readout and write-in circuits, the readout circuits being designed to provide readout pulses having the same polarity as to write-in pulses so as not to destroy the information contained in each memory element.

## 3,587,067
## METHOD OF MANUFACTURING MEMORY MATRICES

Ulrich Ernst Enz, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 17, 1968, Ser. No. 745,579
Int. Cl. G11c 5/04, 5/08, 11/06
U.S. Cl. 340—174 6 Claims



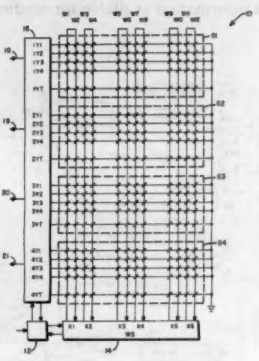
A novel memory matrix and method of making same employing a support plate having formed therein recesses for receiving annular cores. The recesses include a group of conductive bars extending in each recess and above the plate surface. A group of circumscribing recesses are then provided, of a depth exceeding the core recesses but less than the plate thickness. Cores are then inserted into the recesses, and all recesses filled with an epoxy resin, up to slightly above the surface of the plate. The insulating surface is then printed with conductors interconnecting the ends of the bars as desired. The remaining metal on the other side of the support plate is then removed so that the circumscribed areas are electrically separated.

## 3,587,068
## TWO-WIRE MEMORY SYSTEM PROVIDING TEMPORARY STORAGE

George B. Strawbridge, Saint Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 15, 1969, Ser. No. 791,353
Int. Cl. G11c 5/02, 11/06
U.S. Cl. 340—174 M 6 Claims

A two-wire memory system organized in a plurality of groups and blocks with a memory element at each intersection of orthogonally arranged sets of X drive lines and of Y drive-sense lines. The plurality of Y lines that form each group have an associated temporary storage YT line which has a temporary storage memory element associated with each intersecting X line. Memory system operation includes

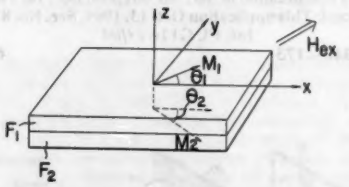


temporary storage in the associated temporary storage element of the information read out of the associated memory element and then subsequent restoration of the readout information back into the associated memory element.

## 3,587,069
## FERROMAGNETIC THIN-FILM MEMORY ELEMENT AND A METHOD OF RECORDING INFORMATION THEREIN

Eiichi Goto, Tokyo-To, Japan, assignor to Zaidan Hojin Parametron Kenkyusho, Chiyoda-Ku, Tokyo-To, Japan

Continuation of application Ser. No. 505,278, Oct. 26, 1965.
Claims priority, application Japan, Oct. 31, 1964, 39/61493
This application Nov. 24, 1969, Ser. No. 872,470
Int. Cl. G11c 11/14
U.S. Cl. 340—174 2 Claims




A ferromagnetic thin-film memory, made of two film layers of ferromagnetic material in which the thickness $d$, and anisotropy field constant $H_{k1}$ of the one layer and the thickness $d_2$, anisotropy field constant $H_{k2}$ and saturation magnetization $M_{s2}$ of the second layer are selected so that the constant $H_{k2}$ is much larger than the constant $H_{k1}$ and satisfy the relationship:

$d_1 \times d_2 \times MPH_{k2} = 1 \times 10^{16}$ erg/cm $2 \times 10^{15}$

and the method of recording on the film.

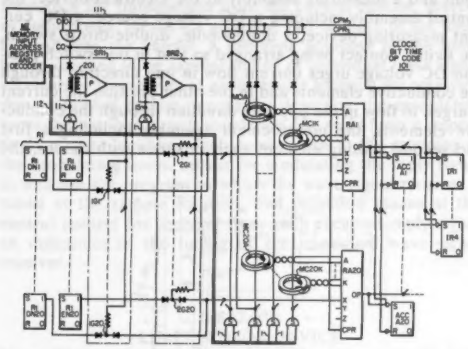
## 3,587,070
## MEMORY ARRANGEMENT HAVING BOTH MAGNETIC-CORE AND SWITCHING-DEVICE STORAGE WITH A COMMON ADDRESS REGISTER

Robert M. Thomas, Waterloo, Ontario, Canada, assignor to Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Dec. 8, 1969, Ser. No. 883,062
Int. Cl. G11c 7/00, 17/00, 5/02
U.S. Cl. 340—174 SP 8 Claims

A read-only ring core memory and a flip-flop or relay temporary memory use a common address register, with two decoded address digits actuating memory drivers and two actuating memory switches. Word wires of the ring core memory are each connected from a driver and isolating

diode, selectively through some cores and round others to store a word, and then to a switch. The temporary memory read circuit uses a transformer with the primary winding con-



nected between a driver and a switch, like the connection of a word wire. Sense windings of the ring cores and gates from the temporary memory outputs are coupled to common read output amplifiers.

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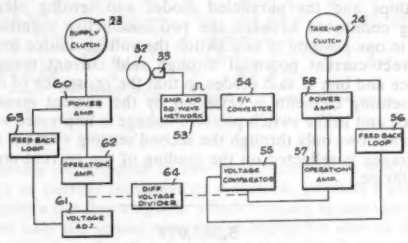
**3,587,071**

## TAPE TRANSPORT CONTROL APPARATUS

**Charles B. Stegman, 8560 Fillbright Ave., Conogo Park, Calif.**

**Filed Feb. 8, 1968, Ser. No. 704,145**
**Int. Cl. G11b** *15/52*; **B65h** *59/00, 59/38*
**U.S. Cl. 340—174.1** **1 Claim**



The tape transport servocontrol apparatus disclosed herein provides a length of magnetic tape extending between a takeup reel and a holdback supply reel trained about an idler roller in alignment with adjacent recording-reproducing heads. A pair of pinch rollers maintain a segment of the tape against the periphery of the idler roller. The takeup reel and the supply reel are motor driven in opposite directions via a pulley arrangement and torque means comprising constant current eddy clutches. Prerecorded tape-speed reference signals are carried on a control drum rotatable in response to rotation of the idler roller and electrical circuit means are employed for adjusting the servo torque of the takeup and holdback reel eddy clutches responsive to a selected track of reference signals on the control drum so that tape speed is regulated thereby.

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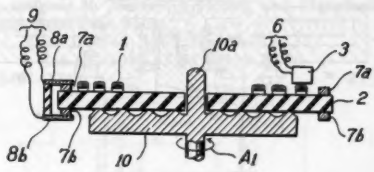
**3,587,072**

## SEQUENTIAL-ACCESS MEMORY OF HIGH DENSITY USING FERROMAGNETIC THIN FILMS

**Shintaro Oshima; Toshihiko Kobayashi, Tokyo-to, and Tetsusaburo Kamibayashi, Kitaadachi-gun, Saitama-ken, all of, Japan, assignors to Kokusai Denshin Denwa Kabuskiki Kaisha, Tokyo-to, Japan**

**Filed Dec. 23, 1968, Ser. No. 786,264**
**Claims priority, application Japan, Dec. 28, 1967, 42/84,274**
**Int. Cl. G11b** *5/02*; **G01d** *15/34*; **G11b** *5/82*
**U.S. Cl. 340—174.1** **10 Claims**

A sequential-access memory of the magnetic disc, drum or tape type by using at least one magnetic head scanning successive memory zones of a storage medium. The storage medium comprises at least one set of composite elongated conductive layers coated respectively with uniform ferromagnetic thin films and deposited side-by-side on the surface of a substratum made as a disc, drum or a tape. The easy magnetization axis of the ferromagnetic thin film is established substantially along planes perpendicular to the longitudinal direction of the elongated conductive layer, the uniform ferromagnetic thin films form a closed magnetic circuit around



each of the composite elongated conductive layers. Information signals are stored in the storage medium by applying these information signals to the respective elongated conductive layers in applying a DC magnetic field to the storage medium by the magnetic head along the hard magnetization direction of the ferromagnetic thin films. The stored information signals are readout from the elongated conductive layers by applying a magnetic field to the storage medium with the magnetic head along the hard magnetization direction of the ferromagnetic thin films.

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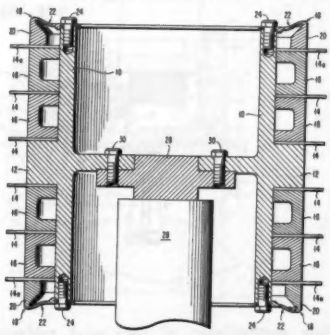
**3,587,073**

## CLAMP FOR ATTACHING MAGNETIC DISKS TO A HUB

**Sanjoy Ghose, San Jose, and Armin Kluth, Los Gatos, both of, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Aug. 21, 1969, Ser. No. 851,848**
**Int. Cl. G11b** *5/82, 25/04*
**U.S. Cl. 340—174.1 R** **4 Claims**



A magnetic storage disc assembly comprises a cylindrical hub, to which a multiplicity of discs and interleaved spacer rings are mounted coaxially. The hub is connected to a rotary drive spindle, whereby the discs may be rotated relative to magnetic heads. The discs and spacer rings are mechanically fastened to the hub, and a flexible ring clamps the discs and spacers together with a uniform pressure.

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**3,587,074**

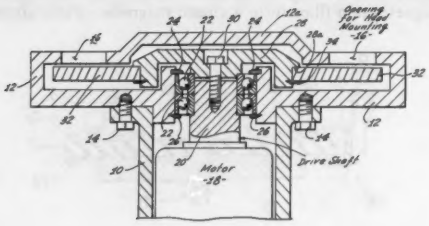
## MAGNETIC DISC ASSEMBLY WITH ANNULAR FLANGE

**Arthur M. Angle, Rolling Hills Estates, and Reinhard Hurlimann, Granada Hills, both of, Calif., assignors to Singer-General Precision, Inc.**

**Filed Sept. 29, 1969, Ser. No. 861,774**
**Int. Cl. G11b** *5/48, 25/04*
**U.S. Cl. 340—174.1 C** **4 Claims**

A rotating disc memory assembly is provided for electronic digital computers, data processors and the like, which is sim-

ple and inexpensive to construct, which requires a minimum number of parts, and yet which provides for a precisely determined spacing between the inner ends of the electromagnetic transducer heads carried by the housing of the assembly and the surface of the rotating memory disc. The assembly to be described includes a rotating hub, which is




precisely positioned with respect to the inner surface of the housing mounting plate for the aforesaid heads, and a wedge-shaped annular C-clamp which holds the disc memory firmly against a peripheral shoulder of the hub in an accurately spaced relationship with respect to the inner ends of the heads mounted in the aforesaid mounting plate.

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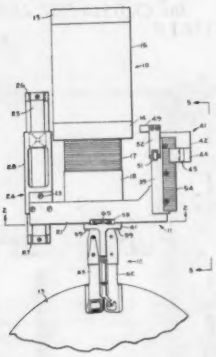
**3,587,075**
**CARRIAGE MECHANISM FOR DIRECT ACCESS DATA STORAGE DEVICE**

**Stanley F. Brown, and Steven J. MacArthur, both of San Jose, Calif., assignors to Information Storage Systems, Inc., Cupertino, Calif.**

**Filed Jan. 21, 1969, Ser. No. 792,454**
**Int. Cl. G11b** *5/48, 17/22, 21/08*
**U.S. Cl. 340—174.1 C** **5 Claims**



Apparatus for supporting an array of read/write heads for precise linear movement radially of a stack of rotatably recording discs, including a carriage for transmitting a drive force to the center of mass of the linear moving assembly, the carriage being supported on a three-point bearing assembly including a pair of right-angle roll assemblies bearing against a precision rail.

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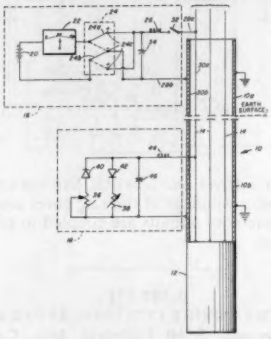
**3,587,076**
**SYSTEM FOR REMOTELY INDICATING SELECTABLY TWO PHENOMENA**

**James R. Grover, 1932 C St. N.E., Miami, Okla.**

**Filed May 9, 1968, Ser. No. 727,854**
**Int. Cl. G08c** *19/04*
**U.S. Cl. 340—182** **4 Claims**

This invention relates to a system for indicating selectably two phenomena associated with a remote electrical device. More particularly, the invention is a system for indicating selectably two phenomena associated with an electrical device remote from a control point in which two conductive elements extend from the control point to the electrical device. The system includes a control assembly at the control point and a measuring assembly at the electrical device, the control assembly including a DC voltage source, a DC current measuring device, a double-pole, double-throw switch, the switch contact being arranged so that in one switch position DC voltage urges current flow in one direction through the conductive elements and in the other position the current is urged to flow in the opposite direction through the conductive elements, the measurement assembly including a first and second sensing element each in series with diodes, the



sensing elements and diode members being connected in parallel with the diodes in opposed current conductivity relationships and the paralleled diodes and sensing elements being connected between the two conductive members so that in one position of said switch the voltage source imposes a direct current potential through said current measuring device and one of said diodes so that the resistance of one of the sensing elements is reflected by the current measuring device and in the switch position voltage is impressed so that current flows only through the second sensing element which resistance is reflected on the reading of the current measuring device.

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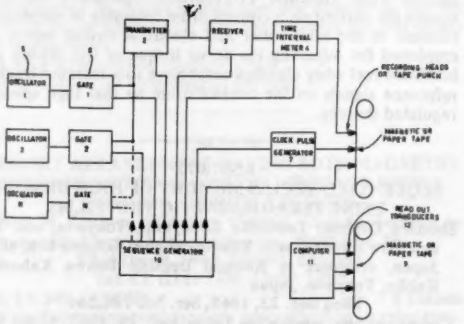
**3,587,077**
**TELEMETRY SYSTEMS**

**Andrew Ferdinand Kaldor, 16 Young Street, Vaucluse, and Lammert Stellema, 19 Reservior Road, Blacktown, both of, New South Wales, Australia**

**Filed Aug. 21, 1968, Ser. No. 754,210**
**Claims priority, application Australia, Aug. 23, 1967, 26,285/67**
**Int. Cl. G08c** *15/12*
**U.S. Cl. 340—202** **4 Claims**



Telemetry equipment for use in an Audience Survey System for ascertaining at a central control the program

channels to which wave signal receivers are tuned at a plurality of remote preselected locations, comprising a single transmission path between the control and remote locations, an interrogation transmitter at the control center, a carrier frequency for transmission from the central control, sources of audio tones, means for grouping two or more of the tones to modulate the carrier, a different grouping of the tones being assigned to be representative of individual wave signal receivers, a transceiver at each remote location for receiving the modulated carrier, means for detecting the modulating tones thereat to initiate transmission of a reply from a respectively remote location which corresponds to the grouping of the modulating tones, means for modulating the reply signal to indicate the program to which the wave signal receiver is tuned at the remote location, and detection means at the central control for deriving from each received reply signal an indication of the tuning of the respective wave signal receiver.

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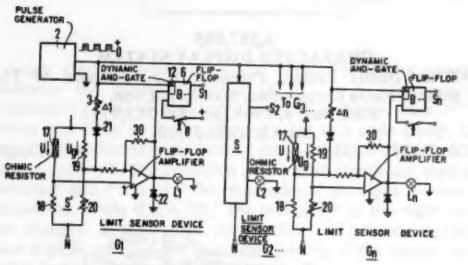
## 3,587,078
## LIMIT SENSOR DEVICE

**Dieter Eichmann, and Georg Russ, Erlangen, both of, Germany**

**Filed Apr. 29, 1968, Ser. No. 725,002**
**Claims priority, application Germany, June 19, 1967, S110 448**
**Int. Cl. G08b** *17/00, 21/00;* **H03r** *5/153*
**U.S. Cl. 340—227** **8 Claims**




A device for response to two limit values of an electrical voltage or current indicative of a variable physical quantity comprises a flip-flop amplifier which receives as input quantities not only the sensed electrical quantity but also an additional periodic pulse. A coincidence gate network connected to the amplifier output and to the pulse source provides a gate output voltage dependent upon the operating state which the flip-flop amplifier exhibits during the pulses and pauses of the periodic input pulse. The gate output voltage is indicative of whether or not the variable quantity being supervised has attained either of the two limit values.

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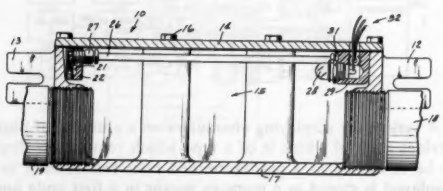
## 3,587,079
## MIST SENSOR

**Ronald F. Obergefell, Cleveland, and Robert R. Roberts, Streetsboro, both of, Ohio, assignors to Houdaile Industries, Inc., Cleveland, Ohio**

**Filed Sept. 4, 1968, Ser. No. 757,401**
**Int. Cl. G08b** *21/00*
**U.S. Cl. 340—270** **4 Claims**



A mist sensor for sensing mist such as oil mist used for lubricating purposes so as to give a warning if the oil mist falls below a predetermined density so that the machine being lubricated may be stopped before being damaged. A test circuit and indicator is provided for assuring that the warning light is operative so that the indicator will not fail to operate due to a faulty indicator circuit.

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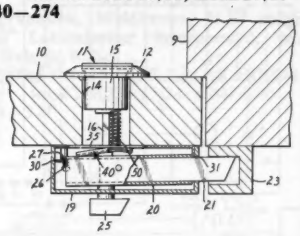
## 3,587,080
## CYLINDER MOUNTING PLATE AND ALARM ACTUATOR

**Paul M Hawkins, Afton Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.**

**Filed June 16, 1969, Ser. No. 833,317**
**Int. Cl. G08b** *13/08;* **H01h** *27/00*
**U.S. Cl. 340—274** **4 Claims**



The combination of a cylinder lock mounting plate and alarm actuating mechanism whereby attempted removal of the lock cylinder by prying or driving the same out of the door will result in operation of an alarm in response to deformation of the mounting plate caused by the application of a predetermined pressure.

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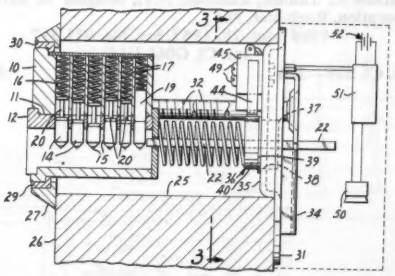
## 3,587,081
## PICK RESISTANT LOCK AND ALARM

**Paul M Hawkins, Afton Township, Washington County, and Allan E. Reynolds, Shoreview, both of, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed June 16, 1969, Ser. No. 833,387**
**Int. Cl. G08b** *13/08;* **H01h** *27/06;* **E05b** *43/00*
**U.S. Cl. 340—274** **9 Claims**



A pin-tumbler type lock in combination with a cam operated upon rotation of the plug to operate a switch connected in circuit relation with a delay device such that upon attempted picking of the lock cylinder the incremental rotation of the plug will operate the switch which if operated for a period of time exceeding that preset time of the delay device will sound an alarm.

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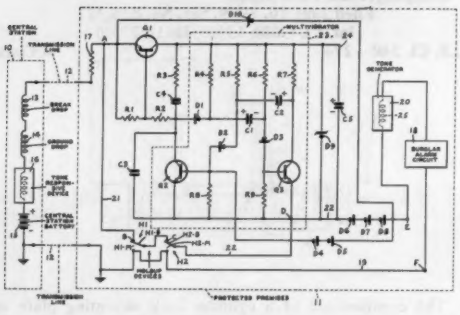
## 3,587,082
## HOLDUP ALARM SYSTEM

**Manfred W. Muehter, Livingston, N.J.; Frederick G. Hill, Yonkers, N.Y., and Anthony C. LaMartina, Jr., Ridgewood, N.Y., assignors to American District Telegraph Company, Jersey City, N.J.**

**Filed Apr. 5, 1968, Ser. No. 719,145**
**Int. Cl. G08b** *29/00, 19/00*
**U.S. Cl. 340—276** **9 Claims**

A holdup alarm system in which the premises to be protected are coupled to a central station via a transmission line,

the central station having a source of direct current potential, a break indicator and a ground indicator connected in series with the line. The protected premises is provided with a normally closed loop circuit connected to the transmission line. The loop circuit includes a manually operable holdup switch having break contacts normally included in the loop circuit and connected to the high side of the transmission line. The holdup switch also has make contacts arranged, upon operation of the holdup switch, to be connected to the low side of



the transmission line. An electronic switch is coupled between the high and low sides of the transmission line when the holdup switch is operated. An astable multivibrator is energized when the holdup switch is operated and operates the electronic switch to successively open and ground the transmission line at a repetition rate controlled by the multivibrator. Means also are provided to prevent a holdup alarm from being given upon an accidental break or ground in the wiring. Means also are provided to supervise the line and associated wiring against open and ground faults.

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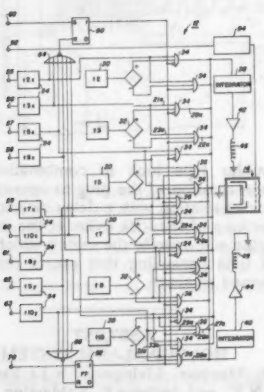
**3,587,083**

## CHARACTER GENERATION AND DISPLAY SYSTEM

**Matthew P. Tubinis, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.**

**Filed Sept. 28, 1967, Ser. No. 671,317**
**Int. Cl. G06f** *3/14*
**U.S. Cl. 340—324** **5 Claims**



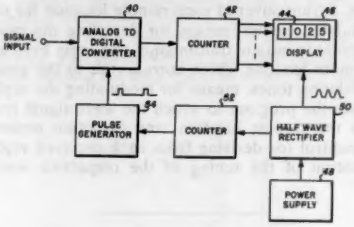
A character generation and display system for characters comprised of a series of connecting line segments of various slopes which are formed by deflection waveforms resulting from integrating over a uniform period of time pulse trains having different frequencies.

**3,587,084**

## CHARACTER DISPLAY APPARATUS

**Rolf Schmidhauser, Palo Alto, Calif., assignor to Data Technology Corporation, Mountain View, Calif.**

**Filed Apr. 30, 1968, Ser. No. 725,331**
**Int. Cl. G08b** *5/00*
**U.S. Cl. 340—324** **2 Claims**




A continuous display digital readout system is disclosed wherein the indicator tubes are periodically inactivated for short periods of time at a rate exceeding the resolution threshold of the human eye, and the data conversion and counting operations are performed during selected ones of these inactivated periods so that no counting flicker is produced in the readout.

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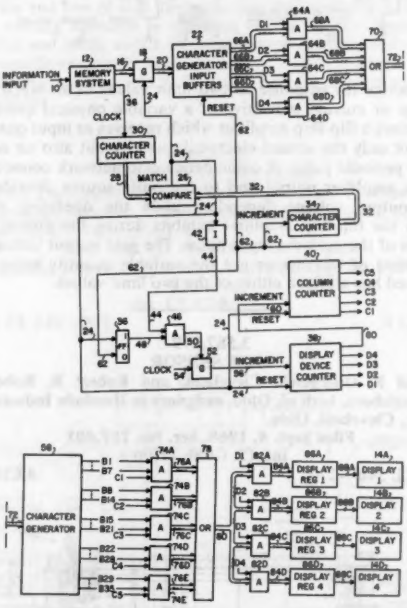
**3,587,085**

## CHARACTER DISPLAY SYSTEM

**William Daniel Baxter, Paramus, N.J., assignor to The Bunker-Ramo Corporation, Stamford, Conn.**

**Filed Nov. 4, 1968, Ser. No. 772,971**
**Int. Cl. G08b** *23/00*
**U.S. Cl. 340—324** **6 Claims**




A system for displaying characters on a plurality of display devices each of which is of a type which requires its display to be refreshed at a predetermined rate. Information to be displayed is stored in a memory means in a first code and is cyclically applied by said memory means to a character generator which generates corresponding characters in a

second display code. Characters to be displayed in a given display position on each of the display devices are sequentially applied to the character generator with the output from the character generator being applied to control the display of at least a portion of the character applied to its input on the appropriate display device.

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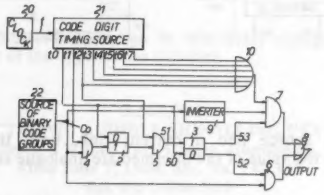
**3,587,086**

## CODE TRANSLATOR CONTROLLED BY THE MOST SIGNIFICANT DIGIT OF A CODE GROUP

**Andre Edouard Joseph Chatelon, Montrouge, France, assignor to International Standard Electric Corporation, New York, N.Y.**

**Filed Mar. 3, 1967, Ser. No. 620,521**
**Claims priority, application France, Mar. 15, 1966, 53391**
**Int. Cl. G06f *5/00*; H04l *3/00*; H03k *13/24***
**U.S. Cl. 340—347** **8 Claims**




Logic circuitry operating under control of timing signals increases the average number of "1" in a code group representing analog amplitudes equal to or higher than $2^{n/1}$, where $n$ is equal to the number of digits in a code group, to improve synchronization derived from the "1"s of the code groups received. The condition of the most significant digit is detected; and if it is "1," the remainder of the digits are complemented, while if it is "0," the remainder of the digits are not changed. In both cases, the condition of the most significant digit is not changed to enable the use of the instant circuitry to recover the original code groups.

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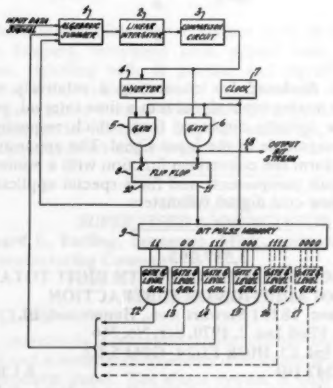
**3,587,087**

## DIGITAL COMPANDING LOOP FOR MONOBIT ENCODER/DECODER

**Eugene King, Yardley, Pa., assignor to RCA Corporation**

**Filed Oct. 17, 1967, Ser. No. 675,940**
**Int. Cl. H03k *13/04***
**U.S. Cl. 340—347** **11 Claims**




There is disclosed a digital communication system for producing and transmitting digital representations of amplitude variant analog signals such as speech. The system's encoder employs a monobit sampling technique in conjunction with a series of digital companding feedback loops. The digital companding loops are utilized to apply internal feedback level variation in the encoder for certain successive bit values indicative of the amplitude conditions of the input signal. Corresponding companding is provided in the system's decoder to produce a substantially accurate multiple step waveform approximation from the single bit per sampling interval quantizing of the original analog input signal.

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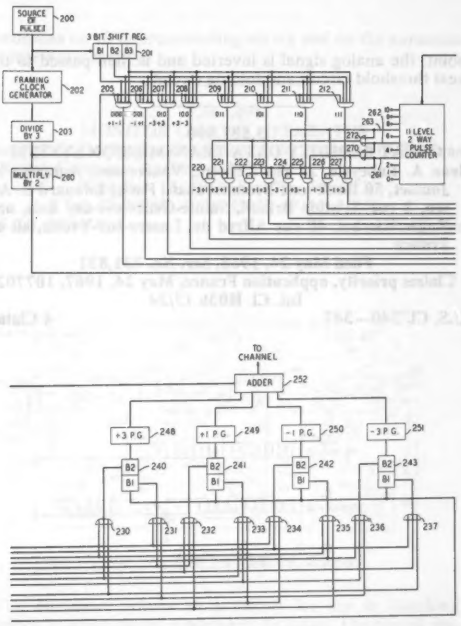
**3,587,088**

## MULTILEVEL PULSE TRANSMISSION SYSTEMS EMPLOYING CODES HAVING THREE OR MORE ALPHABETS

**Peter A. Franaszek, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed Dec. 21, 1967, Ser. No. 692,544**
**Int. Cl. H03k *13/24*; H04l *3/00***
**U.S. Cl. 340—347** **4 Claims**







A binary pulse signal is converted for transmission into a pulse signal having N possible levels in accordance with a code having three or more alphabets with the input signal first divided into words of predetermined length and the words then encoded in accordance with each alphabet in accordance with the state of the transmitted signal at the conclusion of the transmission of the preceding word.

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**3,587,089**

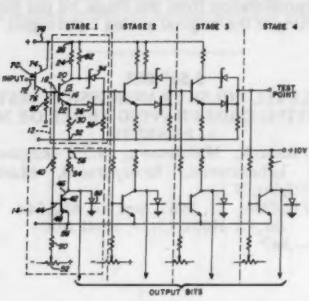
## ANALOG TO GRAY CODE CONVERTER

**Noel P. Elliott, Ashland, Mass., assignor to Raytheon Company, Lexington, Mass.**

**Filed Nov. 2, 1967, Ser. No. 704,961**
**Int. Cl. H03k *13/06***
**U.S. Cl. 340—347** **10 Claims**

Apparatus for converting an analog signal to a digital number represented in Gray code, the apparatus including a chain of threshold circuits in combination with a plurality of folding circuits, each threshold circuits of the chain determining whether the analog signal is above the midpoint of its input range. If the analog signal is above the midpoint, the

analog signal is fed directly to the next threshold circuit and a bit is produced and if the analog signal is below the mid-




point, the analog signal is inverted and is then passed to the next threshold circuit and folding circuit.

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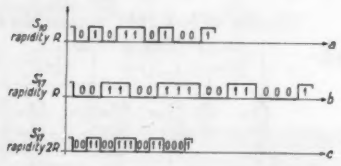
**3,587,090**

**GREAT RAPIDITY DATA TRANSMISSION SYSTEM**

**Jean A. Labeyrie, 21 rue Lenotre, Vaucresson; Antonine A. Jousset, 50 Boulevard Beaumarchais, Paris; Edouard E. Asseo, 2 rue Aristide Briand, Sainte-Genevieve-des Bois, and Roger Kierbel, 40 rue Alfred de, Lozere-sur-Yvette, all of, France**

**Filed May 24, 1968, Ser. No. 731,831**
**Claims priority, application France, May 24, 1967, 107702**
**Int. Cl. H03k** *13/24*
**U.S. Cl. 340—347** **4 Claims**




A data transmission system in which information originally consisting of a succession of binary elements is divided into consecutive groups having a constant number of binary elements, and in which each one of said groups is thereafter replaced, according to a predetermined relationship, by a group having a larger number of binary elements, the arrangement being such that, in the latter groups, every transition between adjacent binary elements of opposite values is preceded by at least two binary elements of the same value.

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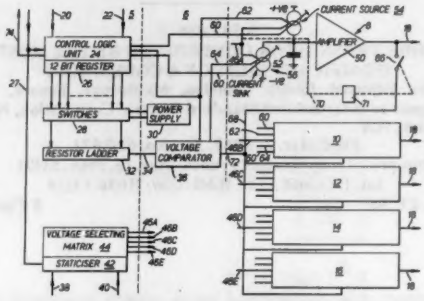
**3,587,091**

**DIGITAL TO ANALOGUE CONVERSION**

**John J. L. Cooper, Lewisham, England, assignor to Elliott Brothers (London) Limited, London, England**

**Filed July 15, 1968, Ser. No. 744,865**
**Int. Cl. H03k** *13/02, 13/10*
**U.S. Cl. 340—347** **2 Claims**

A digital to analogue converter comprises a resistor ladder which produces an intermediate analogue signal dependent on a digital input signal. A comparator compares the intermediate analogue signal with the charge on a capacitor in a selected output channel, and adjusts the charge, by means of




a current source and a current sink, until the charge represents the value of the intermediate analogue signal.

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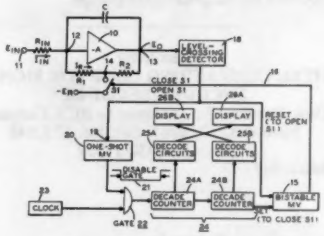
**3,587,092**

**ANALOG-DIGITAL CONVERTERS**

**Austin T. Kelly, Morristown, and John Nagy, Jr., Union, both of, N.J., assignors to Weston Instruments, Inc., Newark, N.J.**

**Filed Apr. 4, 1969, Ser. No. 813,507**
**Int. Cl. H03k** *13/02, 13/10*
**U.S. Cl. 340—347AD** **21 Claims**




Apparatus is disclosed for converting a relatively slow time-varying or analog input signal into a time interval, pulse width and/or a digitally displayed form which respectively represent the magnitude of the input signal. The apparatus is designed to perform the conversion function with a minimum number of circuit components and finds special application in small-sized, low-cost digital voltmeters.

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**3,587,093**

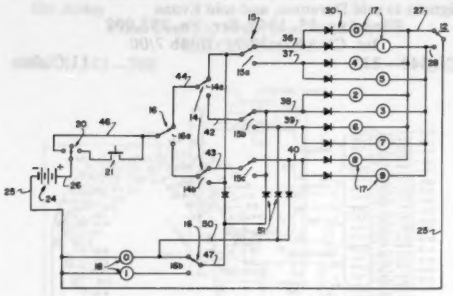
**INDICATING ARRANGEMENT WITH DIGIT TOTAL FROM ADDITION OR SUBTRACTION**

**LeRoy H. Paulsen, 18251 Stewart Ave., Homewood, Ill.**

**Filed Jan. 2, 1970, Ser. No. 366**
**Int. Cl. H03k** *13/24;* **G06f** *5/02*
**U.S. Cl. 340—347 DD** **6 Claims**

A total-indicating arrangement comprises an array of digit-indicating lamps and an array of decade-indicating lamps. A plurality of switches are selectively coupled to increase the display total by a value of $2^n$, where $n$ is a function of the position and circuit connections of the particular switch actu-

ated. Upon restoring the previously actuated switch in the binary system the display total is reduced by the same value.



The accumulated count can be selectively changed by displacement of the appropriate switches.

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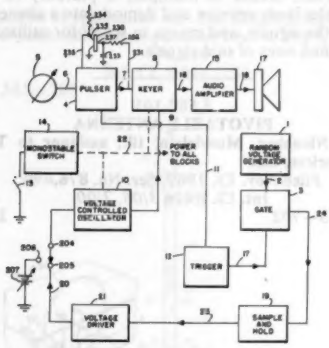
3,587,094
ELECTRONIC AUDIBLE SIGNALLING DEVICES
Raymond Scott, 3 Willow Park Center, Huntington, N.Y.
Filed June 7, 1968, Ser. No. 742,118
Int. Cl. G08b 3/00
U.S. Cl. 340—384 6 Claims




Electronic audible signal devices such as doorbells, buzzers, beepers, telephone bells, school bells, bicycle bells, sirens, signaling bells in general and signalling devices in general are provided by novel combinations of random voltage generators, voltage controlled tone generators, pulsers, triggers, pulse shapers, keyers, audio generators, delay devices, amplifiers and loudspeakers.

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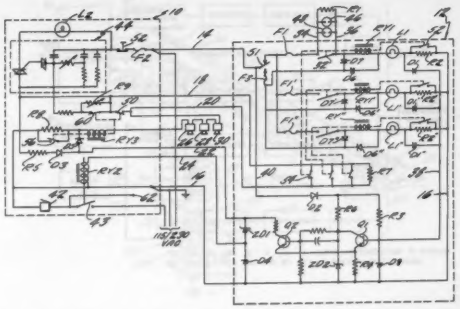
3,587,095
SUPERVISED ANNUNCIATOR
Leonard E. Earling, Tecumseh, Mich., assignor to The Gray Manufacturing Company
Filed May 7, 1968, Ser. No. 727,234
Int. Cl. G08b 29/00
U.S. Cl. 340—409 11 Claims

A completely supervised alarm system having an alarm panel and a remote annunciator unit which is interconnected to the alarm panel. The alarm system is characterized by a memory capability, the ability to add additional circuits to be monitored without additional wiring between the main alarm and remote annunciator panels and without disturbing preexisting supervisory wiring. The system is also characterized by employment of a bidirectional silicon controlled rectifier for supplying energization for audible warning devices and by use of a single relay for the monitoring for open and ground



conditions on all interconnecting wiring and on the annunciator internal circuitry.

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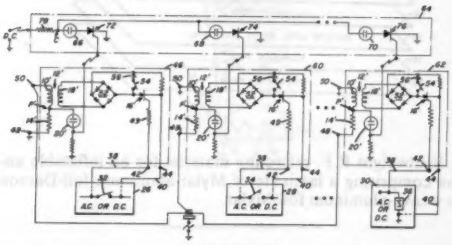
3,587,096
MONITOR CIRCUIT APPARATUS
Hartmut E. Teichmann, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 11, 1968, Ser. No. 766,773
Int. Cl. G08b 19/00; H03k 17/30, 17/80
U.S. Cl. 340—412 6 Claims




The disclosure relates to a circuit for use in checking whether a switch circuit is normally disposed. The circuit employs a control rectifier to vary the impedance reflected into a transformer primary winding by a secondary winding thereof, which reflected impedance determines the quotient signal developed by means of the transformer primary winding in combination with another impedance. The quotient signal, depending on its magnitude, actuates, or not, a threshold detector; and the control rectifier is turned on, or off, by means of the switch circuit being monitored.

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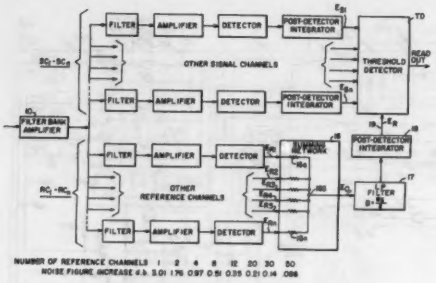
3,587,097
SIGNAL RETRIEVAL SYSTEM WITH CONTINUOUS CONTROL OF DETECTION THRESHOLD LEVEL
Keefer S. Stull, Jr., Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Dec. 5, 1966, Ser. No. 599,030
Int. Cl. G01r 23/00; G01s 9/42, 9/44
U.S. Cl. 343—7 A 12 Claims

This invention provides a special spectrum analyzer especially adapted to be used in connection with a Doppler radar system. The analyzer comprises a bank of contiguous filters connected to the radar receiver which are utilized to discriminate between targets having different Doppler frequen-

cy shifts. The output of each filter is amplified, detected, and integrated. The various integrator voltages are then compared to a reference voltage which helps eliminate error due to noise, to determine if a target is present.

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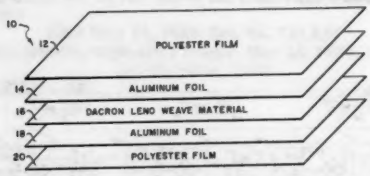
**3,587,098**

## LIGHTWEIGHT REFLECTING MATERIAL FOR RADAR ANTENNAS

**Charles N. Gosnell, Catonsville, Md., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Oct. 11, 1968, Ser. No. 766,888**
**Int. Cl. H01q** *15/20*
**U.S. Cl. 343—915** **9 Claims**




A lightweight R.F. reflecting material for an inflatable antenna comprising a laminate of Mylar-aluminum foil-Dacron leno weave-aluminum foil-Mylar.

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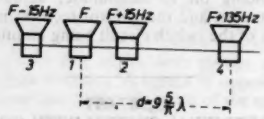
**3,587,099**

## SECTOR RADIO BEACON

**Ernst Kramar, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.**

**Filed Mar. 4, 1969, Ser. No. 804,166**
**Int. Cl. G01s** *1/44*
**U.S. Cl. 343—106** **4 Claims**



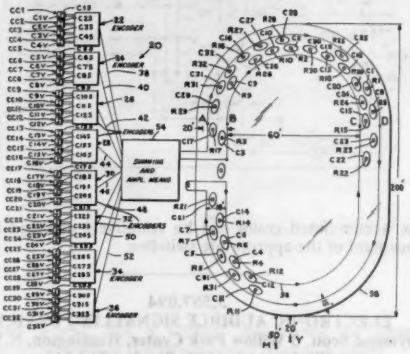

To provide a rotating radiation pattern in a given sector, an antenna which radiates a carrier frequency F is flanked, substantially along a line, on one side by a directional antenna which radiates a frequency F—15 Hz. and on the other side by a directional antenna radiating a frequency F+15 Hz. and a directional antenna radiating a frequency F+135 Hz. The directional antennas radiate in a direction substantially perpendicular to said line. The antenna spacing is dependent upon the carrier frequency and the desired width of said sector.

**3,587,100**

## SIGNAL TRANSMISSION AND RECEIVING SYSTEM

**William Doremus, Sparta; Edgar J. Evans, Parsippany, both of, N.J., and Jan. H. Helbers, Rochester, Mich., said Helbers assignors to said Doremus, and said Evans**

**Filed Aug. 15, 1968, Ser. No. 753,002**
**Int. Cl. A63h** *30/04*; **H04b** *7/00*
**U.S. Cl. 343—225** **11 Claims**




A signal transmission system including means to modulate a carrier in accordance with signals, modulated carrier transmission means, means to multiplex a plurality of carriers, means to selectively receive and demodulate a chosen carrier to provide the signals, and means to select for utilization only predetermined ones of said signals.

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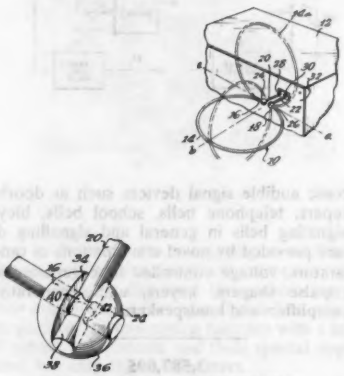
**3,587,101**

## PIVOTABLE ANTENNA

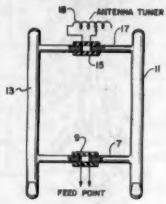
**Frank H. Nienaber, Mundelein, Ill., assignor to Television Laboratoriese, Inc.**

**Filed Nov. 13, 1969, Ser. No. 876,490**
**Int. Cl. H01q** *3/08*, *7/00*
**U.S. Cl. 343—702** **23 Claims**



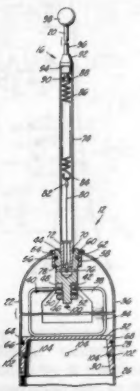
A two terminal antenna in which the drive element is coupled to a pair of conductive members through a pair of one-piece blocks. Each of the blocks defines a pair of mutually perpendicular openings for receiving one of the conductive members and one of the driven element terminals in perpendicular relationship. The walls of the block which define the openings provide a frictional surface permitting universal pivotal movement of the driven element and provide a retaining force to retain the driven element in a selected orientation.

3,587,102
## HELICOPTER SKID ANTENNA
Watson P. Czerwinski, Shrewsbury, N.J., assignor to The United States of America as represented by the Secretary of the Army
Filed Dec. 31, 1969, Ser. No. 889,499
Int. Cl. H01q 1/28
U.S. Cl. 343—708 6 Claims




The struts which are disposed perpendicular to the roll axis of a helicopter for supporting the landing skids thereof are insulated from the helicopter fuselage. One of the struts has an antenna feed at its center, whereby the entire landing gear assembly functions as a folded dipole antenna or a loop antenna, depending on the operating frequency.

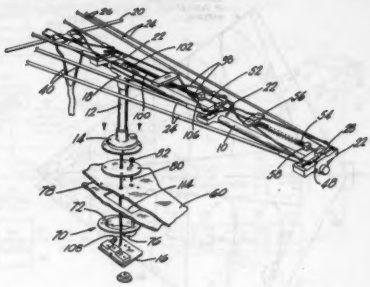
3,587,103
## STOWABLE RADIO ANTENNA
George Smith Lawrie, and Don Mills, both of Ontario, Canada, assignors to The Garrett Corporation, Los Angeles, Calif.
Continuation of application Ser. No. 628,899, Apr. 6, 1967, now abandoned. This application Dec. 4, 1969, Ser. No. 876,160
Int. Cl. H01g 1/34
U.S. Cl. 343—709 7 Claims



A tubular sleeve at the base end of an antenna encloses a tension spring, an end of which is secured to a wall having a socket member arranged to receive a plug member on the base end of the antenna. The spring erects the antenna from the wall with the plug in the socket. Alternatively, the socket may be disposed on the end of the antenna and the plug on the wall.

3,587,104
## FOLDABLE ANTENNA
Jack C. Budrow, and Glenn A. Reed, both of Battle Creek, Mich., assignors to Braund Manufacturing Co., Battle Creek, Mich.
Filed Jan. 8, 1969, Ser. No. 789,834
Int. Cl. H01q 1/32
U.S. Cl. 343—714 12 Claims

An antenna, such as a television antenna, particularly suitable for mounting upon the roof of a recreational vehicle, such as a travel trailer, mobile home, camper or the like, wherein the antenna may be controlled from the vehicle interior. The antenna control includes rotation for directional purposes, and also includes signal receiving dipoles foldable between open and closed positions permitting the dipoles to be folded to the closed position when the vehicle is transported.



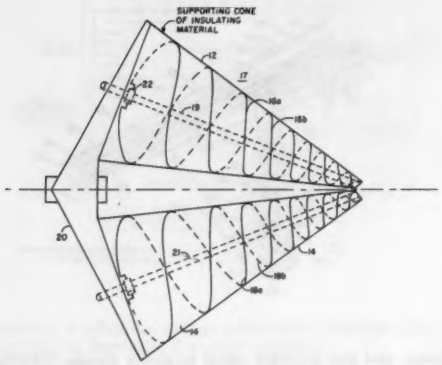
3,587,105
## PICTURE FRAMED ANTENNA
Warren E. Neilson, 255 E. Wendy Way, King of Prussia, Pa.
Filed Sept. 12, 1968, Ser. No. 759,423
Int. Cl. H01q 1/00
U.S. Cl. 343—720 2 Claims

A television antenna adapted for indoor use which is maintained obscured by serving as the backing member for a picture frame and picture which antenna includes a thin rigid dielectric circuit board having a circuit pattern thereon approximating a dipole antenna. The television antenna wire serves to position a backing easel to properly incline the antenna for maximum reception. Antenna extensions from the main antenna are provided to adjust the electrical length of the antenna in poor reception conditions. In another embodiment, a folded dipole antenna is provided by means of three circuit boards disposed in three hinged picture frames forming a horizontal array in which the antenna pattern on the circuit boards is made electrically continuous through connections in the hinges of the picture frames.

3,587,106
## BROAD BAND ANTENNAS HAVING SPIRAL WINDINGS
James W. Crooks, Jr., and Ray M. McIntyre, Jr., both of San Diego, Calif., assignors to General Dynamics Corporation
Filed July 15, 1968, Ser. No. 745,014
Int. Cl. H01q 1/36
U.S. Cl. 343—739 17 Claims

A broad band antenna or feed for a parabolic reflector having a pair of spiral windings skewed with respect to the axis of a conical support surface on which they are wound in alternating relationship. Two such supports are rotatably mounted with their axes offset at an angle from the reflector

axis so as to conically scan the target area. The feed achieves maximum illumination of the control portion of the reflector




and provides a constant squint angle with respect to the reflector axis over a broad band of frequencies.

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**3,587,107**

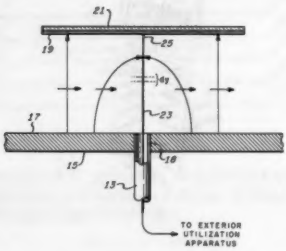
**TIME LIMITED IMPULSE RESPONSE ANTENNA**

**Gerald F. Ross, Lexington, Mass., assignor to Sperry Rand Corporation**

**Filed June 11, 1969, Ser. No. 832,337**

**Int. Cl. H01q** *9/36*

**U.S. Cl. 343—739** **8 Claims**




An antenna for producing an output pulse of desired duration in response to an impulsive wave front includes a resistive plate mounted above a ground plane. A coaxial transmission line projects through the ground plane so that its center conductor contacts the resistive plate and its outer conductor terminates flush with the ground plane. The resistive plate consists of a submicron film of resistive material deposited on a dielectric backing and is spaced from the ground plane at a distance approximating the distance travelled by an electromagnetic wave in a time equal to the desired pulse duration.

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**3,587,108**

**TRANSMITTING ANTENNA EMPLOYING END-FIRE ELEMENTS**

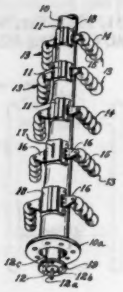
**Richard D. Bogner, Roslyn, N.Y., assignor to Ampex Corporation, Redwood City, Calif.**

**Filed Aug. 18, 1967, Ser. No. 661,625**

**Int. Cl. H01q** *13/10, 1/12, 15/14*

**U.S. Cl. 343—770** **31 Claims**

A transmitting antenna assembly wherein an elementary driven antenna and parasitic end-fire directors may be supported by a tower or the like, and by positioning the end-fire directors in various orientations relative to the driven antenna and tower, various selected radiation patterns may be obtained, ranging from an omnidirectional type to a single lobe



directional type. Driven antennas of different polarizations may be employed.

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**3,587,109**

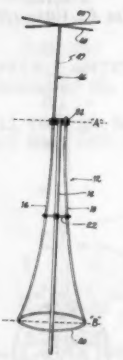
**OMNI-DIRECTIONAL COMMUNICATIONS ANTENNA HAVING CAPACITIVELY LOADED TOP**

**Louis J. Martino, 343 N. Craig Place, Lombard, Ill., and Herbert R. Blaese, Chicago, Ill.**

**Filed Nov. 29, 1968, Ser. No. 779,942**

**Int. Cl. H01q** *9/16*

**U.S. Cl. 343—792** **14 Claims**



A communications antenna which includes a vertical conductive mast and a pair of one-quarter wave length conductors extending downwardly from a first reference level to a second reference level. The conductors are electrically connected at the second reference level and one of the conductors is electrically connected to the mast at the first reference level. A one-eighth wavelength conductor extends upwardly from the first reference level and is electrically connected to the mast at the first reference level. The one-eighth wavelength conductor is capacitively loaded at its top to act as a one-quarter wavelength conductor.

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**3,587,110**

**CORPORATE-NETWORK PRINTED ANTENNA SYSTEM**

**Oakley McDonald Woodward, Princeton, N.J., assignor to RCA Corporation**

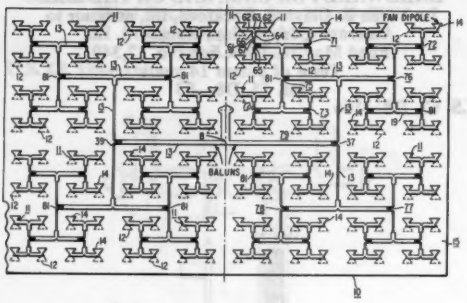
**Filed July 1, 1969, Ser. No. 838,226**

**Int. Cl. H01g** *21/06;* **H01q** *21/12;* **H01p** *3/08*

**U.S. Cl. 343—813** **3 Claims**

A corporate-network printed antenna system is described

wherein the feed lines are located in coplanar relationship




with and in the field of the antenna.

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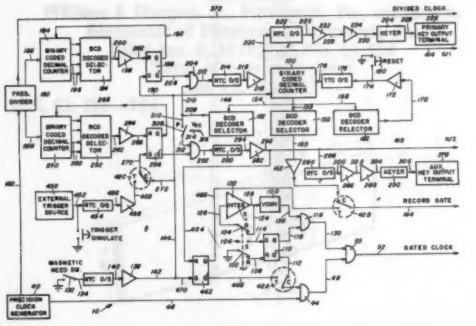
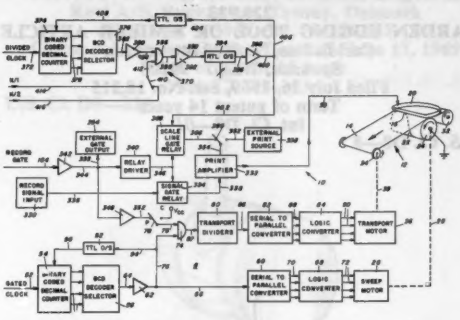
**3,587,111**
**DIGITAL CORRELATION RECORDER**
**Kenneth E. Prada, Wareham, Mass.**
**Filed Mar. 19, 1970, Ser. No. 20,959**
**Int. Cl. G01d 9/38**
**U.S. Cl. 346—33 EC** **9 Claims**




Keying and recording functions in a correlation recorder are performed by digital circuitry. Each function is synchronized to the other by a precision clock generator. Among the functions controlled are: keying signals for initiating external events, printing of input signals representing external events, and record transport for proper positioning of the input signal on a permanent record with a precisely known time relationship to the keying signals. The time



sequence of keying and recording functions is precisely adjustable over a wide range of settings.

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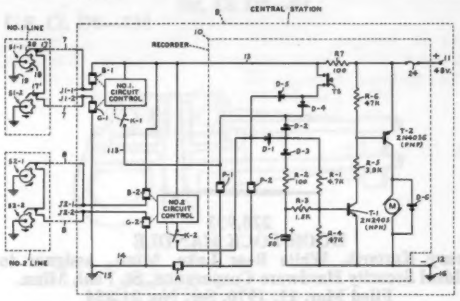
**3,587,112**
**ELECTRICALLY OPERATED SIGNAL RECORDING DEVICE FOR PROTECTIVE SYSTEMS**
**Frederick G. Hill, Yonkers, N.Y., assignor to American District Telegraph Company, Jersey City, N.J.**
**Filed Nov. 12, 1969, Ser. No. 875,821**
**Int. Cl. G08b 25/00**
**U.S. Cl. 346—50** **6 Claims**




The present invention comprises a completely electrically operated signal recording device for use with central station electrical protection systems of the McCulloh type. Means are provided to ensure fast starting of the recorder upon the receipt of an incoming signal, to allow for a period of tape runout upon the completion of the signal, to permit the receipt of signals from two protection circuits simultaneously without interference and to allow the concurrent testing of both recorder signal channels.

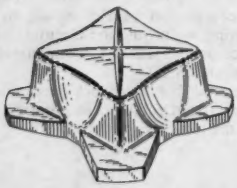
All of the feature of the prior art mechanically driven signal recorders have been retained in a design both simple and inexpensive to manufacture and maintain.

# DESIGNS

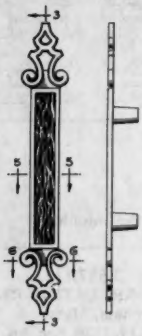
JUNE 22, 1971

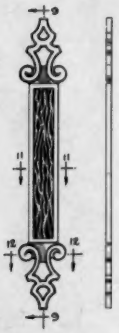
**220,932**
**GARDEN EDGING TOOL OR SIMILAR ARTICLE**
Carl B. Jess, N. 4108 Stevens St., Spokane, Wash. 99205
Filed July 16, 1969, Ser. No. 18,215
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—8

**220,933**
**DOOR LOCK HANDLE**
Henry Kartarik, White Bear Lake, Minn., assignor to Ideal Security Hardware Corporation, St. Paul, Minn.
Filed Mar. 11, 1970, Ser. No. 21,854
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—132

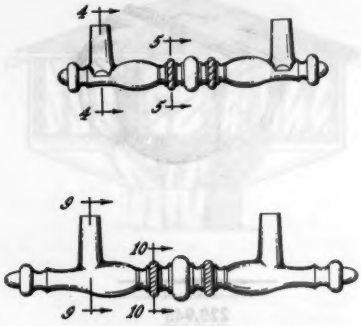


**220,934**
**HARDWARE FOR CABINETS OR THE LIKE**
La Verne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed May 26, 1969, Ser. No. 17,349
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—166



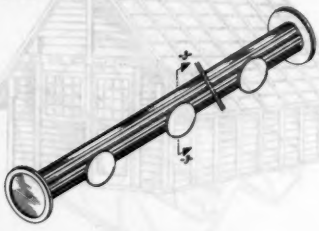


220,935
PULL
Raymond U. H. Tegner and La Verne E. Clayton, Rockford, Ill., assignors to Amerock Corporation, Rockford, Ill.
Filed Oct. 16, 1969, Ser. No. 19,593
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—166

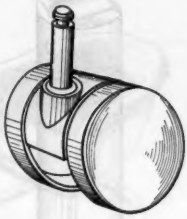


220,936
HANDLE
William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.
Filed Jan. 8, 1970, Ser. No. 20,834
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—166

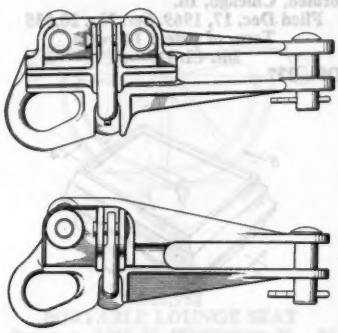
220,937
CURTAIN ROD
Mark O. Unitz, Mountain View, Calif., assignor to F.J.L. Corporation, Palo Alto, Calif.
Filed May 9, 1969, Ser. No. 17,094
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—208



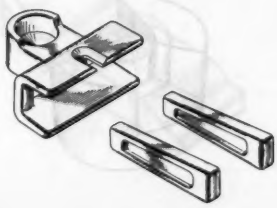
220,938
CASTOR
Bent K. F. Harlang, Hellerup, Denmark, assignor to Kevi A/S, Rugvaenget, Tastrup, Denmark
Filed Dec. 9, 1969, Ser. No. 20,422
Claims priority, application Denmark June 17, 1969
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—226



220,939
DEAD END CLAMP
L. E. Lindsey, 222 Vista Ave., Pasadena, Calif. 91007, and Herbert F. Sammons, Glendale, Calif.; said Sammons assignor to said Lindsey
Filed June 16, 1969, Ser. No. 17,726
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—230

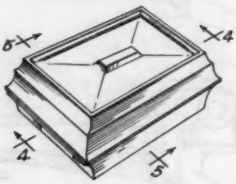


220,940
CLAMP FOR SECURING A REACTIVE MEMBER OR THE LIKE
Wayne E. Hunnicutt, Big Bend, and Peter G. Rossbach, Waukesha, Wis., assignors to Applied Power Industries, Inc., Milwaukee, Wis.
Filed July 15, 1968, Ser. No. 12,752
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—235

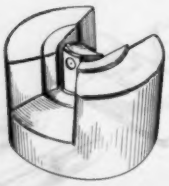


220,941
PRESSURIZED DISPENSING CONTAINER
Norman Usen, West Haverstraw, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed Mar. 4, 1970, Ser. No. 21,745
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—9

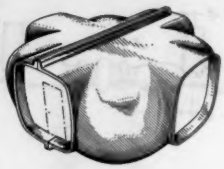
220,942
COVERED TRAY
John A. Bridges, Nashville, and Margaret E. Wilson, Chapel Hill, Tenn., assignors to Aladdin Industries, Incorporated, Chicago, Ill.
Filed Dec. 17, 1969, Ser. No. 20,535
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—237



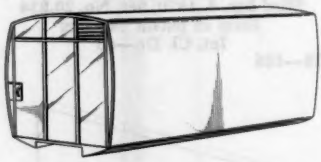
220,943
DISPENSER CAP FOR A PRESSURIZED CONTAINER
Theodore Andrew Beck, Andover, Mass., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Mar. 2, 1970, Ser. No. 21,689
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D9—258



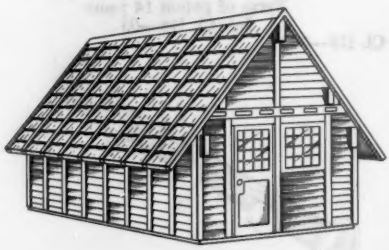
220,944
HOUSE OR SIMILAR ARTICLE
James R. Thomson, 705 N. 25th St., Philadelphia, Pa. 19130
Filed Feb. 12, 1970, Ser. No. 21,410
Term of patent 7 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



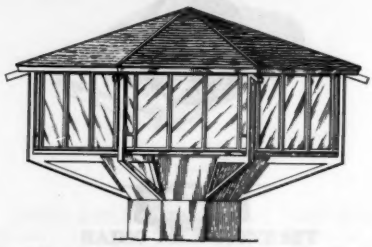
220,945
HOUSE
Henry S. Hughes, 1320 Talbryn Drive, Belmont, Calif. 94002
Filed Mar. 9, 1970, Ser. No. 21,808
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



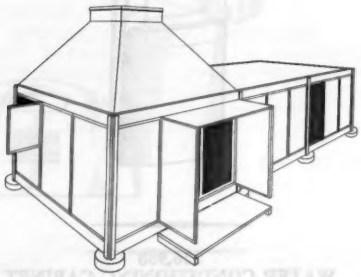
220,946
HOUSE
Henry S. Hughes, 1320 Talbryn Drive, Belmont, Calif. 94002
Filed Mar. 9, 1970, Ser. No. 21,810
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



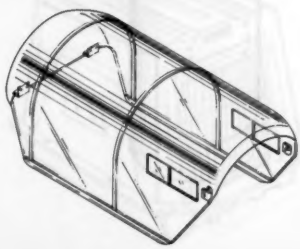
220,947
**BUILDING STRUCTURE**
Guy A. Bartoli, 2914–C St. Mark Road, Winston-Salem, N.C. 27103
Filed June 1, 1970, Ser. No. 23,246
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



220,948
**MODULAR BUILDING STRUCTURE**
Robert D. Hermanson, 1709 W. 75th St., Richfield, Minn. 55423
Filed June 4, 1970, Ser. No. 23,307
Term of patent 3½ years
Int. Cl. D25—*04*
U.S. Cl. D13—1

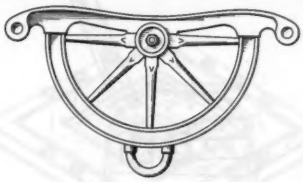


220,949
**SNOWMOBILE COVER**
Charley Williamson, 4525 S. Federal, Apt. 1406, Chicago, Ill. 60609
Filed Dec. 8, 1969, Ser. No. 20,409
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—27



220,950
**CHAIR**
Leonardo D. Sideri, 1809 Gough St., San Francisco, Calif. 94109
Filed July 31, 1969, Ser. No. 18,484
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—1

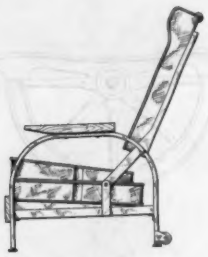
220,951
**ARMREST FOR A CHAIR**
Raymond T. Carlson, 1405 Peter Pan Road, Lookout Mountain, Ga. 37350
Filed Sept. 29, 1969, Ser. No. 19,335
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D15—1



220,952
**PORTABLE LOUNGE SEAT**
David J. Petersen, 2219 N. Washington St. 98406, and Bruce S. Martin, 2224 N. Puget Sound 98405, both of Tacoma, Wash.
Filed Aug. 12, 1968, Ser. No. 13,096
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—11

220,953
**INFLATABLE LOUNGE**
Louis R. Des Pres, East Haven, Conn., assignor to Divers International, Inc., New Haven, Conn.
Filed Oct. 24, 1969, Ser. No. 19,709
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—11

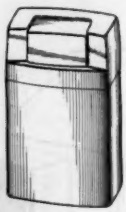
220,954
**MOBILE LOUNGE CHAIR**
Jack E. Spence, Collins, Miss., assignor to Dura-Fold Machine Works, Incorporated, Jackson, Miss.
Filed Jan. 22, 1970, Ser. No. 21,026
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—11



220,955
**BENCH**
Ralph Mondragon, Taos, N. Mex.
(P.O. Box 199, Ranches of Taos, N. Mex. 57571)
Filed Feb. 27, 1970, Ser. No. 21,657
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—11

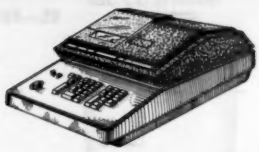
220,956
**PHARMACEUTICAL TABLET**
Edwin F. Roberts, Stamford, Conn., assignor to Ives Laboratories, Inc., New York, N.Y.
Filed Dec. 16, 1969, Ser. No. 20,729
Term of patent 14 years
Int. Cl. D28—*01*; D1—*02*
U.S. Cl. D16—3

220,957
**WATER SOFTENER CABINET**
William Jackson Marsh, Garden Grove, Calif., assignor to Robert Marsh Enterprises, Inc., Santa Ana, Calif.
Filed Dec. 29, 1969, Ser. No. 20,666
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

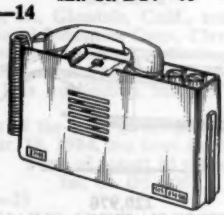


220,958
**WATER CONDITIONING CABINET**
William Jackson Marsh, Garden Grove, Calif., assignor to Plasworld, Inc., Santa Ana, Calif.
Filed Mar. 9, 1970, Ser. No. 21,786
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

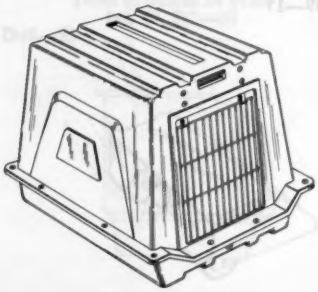
220,959
**DESK ELECTRONIC CALCULATOR**
Tetsuo Kashiwagi and Hirosuke Katsumi, Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 13, 1969, Ser. No. 20,070
Term of patent 7 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



220,960
**RADIO TELEPHONE SET**
Per Erik Edward Heribertson, Lidingo, Sweden, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Oct. 20, 1969, Ser. No. 19,621
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

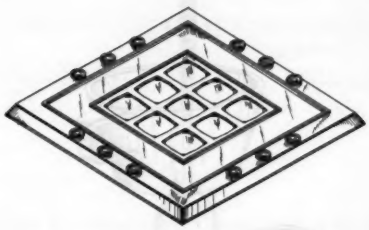


220,961
**PORTABLE PET KENNEL**
Ralph E. Ringelman, Ossining, N.Y. (403 N. Warpole, Upper Sandusky, Ohio 43351), and John F. Sullivan, Drawer 502, Westerly, R.I. 02891
Filed May 25, 1970, Ser. No. 23,114
Term of patent 14 years
Int. Cl. D30—*01*
U.S. Cl. D30—1

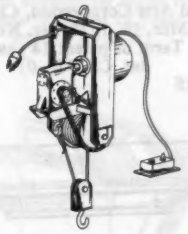


220,962
**CLOTHES HANGER SUPPORT ROD**
Mark O. Uitz, Mountain View, Calif., assignor to F.J.L. Corporation, Palo Alto, Calif.
Filed May 8, 1969, Ser. No. 17,083
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—8

220,963
**GAME BOARD OR THE LIKE**
Aaron G. Cohen, Los Angeles, Calif., and Michael C. Mills, Middlesex, and Dermot Sims, Piscataway, N.J., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Aug. 5, 1970, Ser. No. 24,586
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

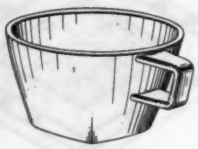


220,964
**PORTABLE POWER HOIST**
Robert D. Ledington, Star Rte., Fayette, Idaho 83661
Filed Feb. 2, 1970, Ser. No. 21,207
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D41—1



220,965
COMBINED CLOCK AND WALL PLAQUE
John H. Jordan, Jr., 8124 S. Crandon Ave., Chicago, Ill. 60617
Filed Aug. 4, 1970, Ser. No. 24,293
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7

220,966
CUP
Robert F. Bateman, St. Paul, Minn., assignor to Plastics, Inc., St. Paul, Minn.
Filed May 25, 1970, Ser. No. 23,134
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—9



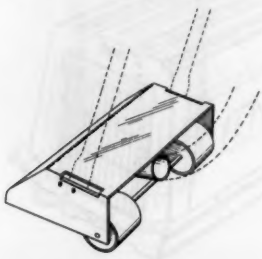
220,967
COVERED FOOD SERVING VESSEL
Irwin Schneider, Lincolnwood, Ill., assignor to Imperial Arts Corporation, Chicago, Ill.
Filed Mar. 16, 1970, Ser. No. 21,906
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15

220,968
FINDING FOR A PIERCED EARRING
Joseph M. Pepitone, North Babylon, N.Y., assignor to Pelo Industries, Inc., Pawtucket, R.I.
Filed June 2, 1969, Ser. No. 17,457
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—9

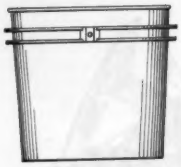
220,969
ELECTRIC VACUUM CLEANER BODY
Paul O. Rawson, Jr., Easton, and Bruno M. Valbona and John J. Hamilton, Avon, Conn., assignors to Dynamics Corporation of America, New York, N.Y.
Filed Mar. 9, 1970, Ser. No. 21,780
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D49—13

220,970
ELECTRIC VACUUM CLEANER
Paul O. Rawson, Jr., Easton, and Bruno M. Valbona and John J. Hamilton, Avon, Conn., assignors to Dynamics Corporation of America, New York, N.Y.
Filed Mar. 9, 1970, Ser. No. 21,784
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D49—13

220,971
CARPET CLEANER PICKUP HEAD
Judson O. Jones, 17 Inglewood Drive, Greenville, S.C. 29607
Filed Feb. 6, 1970, Ser. No. 21,302
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D49—17



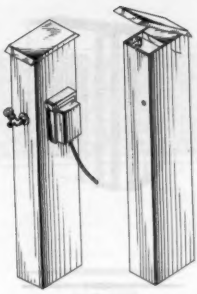
220,972
**BUCKET**
George Yates, Jr., Glendale, Calif., assignor to Growth International Industries Corp., Cleveland, Ohio
Continuation-in-part of design application Ser. No. 19,063, Sept. 8, 1969. This application Jan. 2, 1970, Ser. No. 20,735
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D49—29



220,973
**BUCKET**
George Yates, Jr., Glendale, Calif., assignor to Growth International Industries Corp., Cleveland, Ohio
Continuation-in-part of design application Ser. No. 13,761, Sept. 27, 1968, now Patent No. 216,833, dated Mar. 10, 1970. This application Jan. 30, 1970, Ser. No. 21,154
The portion of the term of the patent subsequent to Mar. 10, 1984, has been disclaimed
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D49—29

220,974
**TRASH CAN FUNNEL**
Joseph Mirabile, 14224 Talbot, Warren, Mich. 48093
Continuation-in-part of design application Ser. No. 10,992, Mar. 15, 1968. This application May 9, 1969, Ser. No. 17,092
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D49—35

220,975
**COIN OPERATED UTILITY CONTROL OR SIMILAR ARTICLE**
Reuben E. Peot, Kahlotus, Wash. 99335
Filed June 16, 1969, Ser. No. 17,709
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3

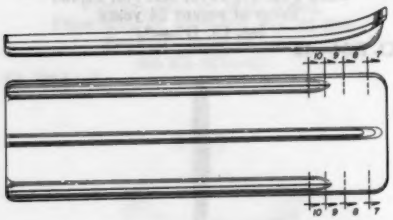


220,976
**SPOON OR SIMILAR ARTICLE**
Robert S. Conland, Vernon, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Feb. 17, 1970, Ser. No. 21,467
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

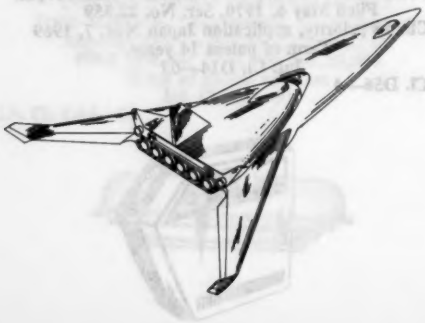
220,977
**RADIO RECEIVER**
Masanori Hamada, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed May 6, 1970, Ser. No. 22,859
Claims priority, application Japan Nov. 7, 1969
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4

220,978
RADIO RECEIVER
Sakae Nakamoto, Kobe, and Masanori Hamada, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed May 6, 1970, Ser. No. 22,860
Claims priority, application Japan Nov. 7, 1969
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4

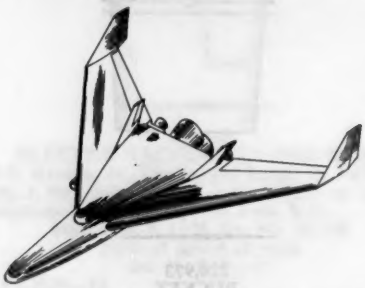
220,979
COMBINATION SURFER AND TOBOGGAN
John Belik, 915 S. Jenifer St., Glendora, Calif. 91740
Filed July 30, 1969, Ser. No. 18,480
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D71—1



220,980
REUSEABLE MULTISTAGE AEROSPACE VEHICLE
James E. Webb, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Harold S. Becker, Palos Verdes Estates, Selwyn Enzer, Orange, William H. Hand, Redondo Beach, Peter Rosati, Garden Grove, and Norman C. Surtees, San Pedro, Calif.
Filed Feb. 5, 1965, Ser. No. 83,866
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D71—1

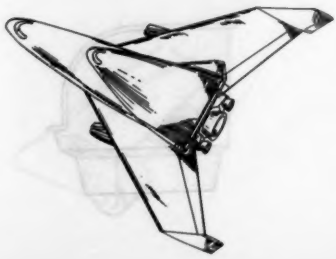


220,981
TWO-STAGE AEROSPACE VEHICLE
James E. Webb, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Harold S. Becker, Palos Verdes Estates, Selwyn Enzer, Orange, William H. Hand, Redondo Beach, Peter Rosati, Garden Grove, and Norman C. Surtees, San Pedro, Calif.
Filed Feb. 5, 1965, Ser. No. 83,872
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D71—1



220,982
REUSEABLE ORBITAL CARRIER AEROSPACE VEHICLE
James E. Webb, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Carl F. Ehrlich, Jr., Woodland Hill, Calif.
Filed Sept. 30, 1964, Ser. No. 82,077
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D71—1

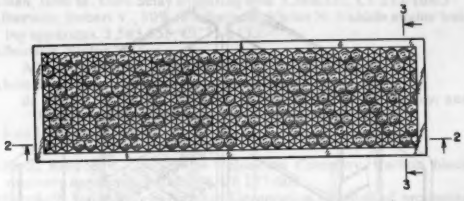
220,983
REUSEABLE TWO-STAGE AEROSPACECRAFT
James E. Webb, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Harold S. Becker, Palos Verdes Estates, Selwyn Enzer, Orange, William H. Hand, Redondo Beach, Peter Rosati, Garden Grove, and Norman C. Surtees, San Pedro, Calif.
Filed Feb. 5, 1965, Ser. No. 83,867
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D71—1



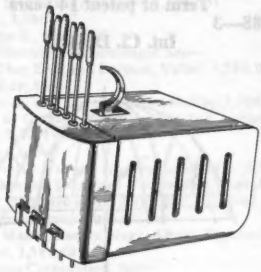
220,984
AEROSPACE CRAFT
Hugh L. Dryden, Deputy Administrator of the National Aeronautics and Space Administration, with respect to an invention of Donald Lee Kelly, Sunland, Calif.
Filed Feb. 20, 1964, Ser. No. 78,767
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D71—1

220,985
REUSEABLE CARRIER-ORBITAL AEROSPACE VEHICLE
James E. Webb, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Harold S. Becker, Palos Verdes Estates, Selwyn Enzer, Orange, William H. Hand, Redondo Beach, Peter Rosati, Garden Grove, and Norman C. Surtees, San Pedro, Calif.
Filed Apr. 16, 1965, Ser. No. 84,874
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D71—1

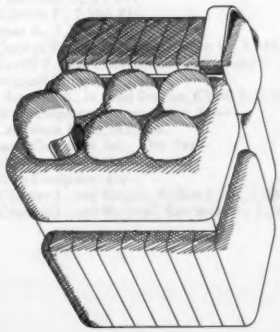
220,986
COMBINED REFLECTOR AND LENS
Sidney A. Heenan, Park Ridge, and Eugene A. Peterson, Northbrook, Ill., assignors to Amerace Esna Corporation, Union, N.J.
Filed Apr. 6, 1970, Ser. No. 22,273
Term of patent 14 years
Int. Cl. D29—*99;* D12—*99;* D26—*06*
U.S. Cl. D72—1



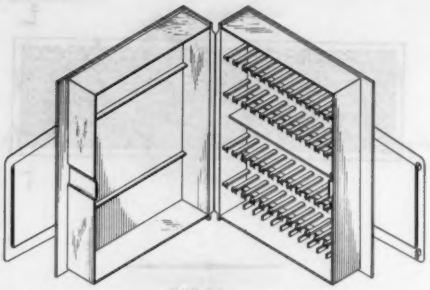

220,987
MINIATURE POWER ACTUATED MULTIPLE PUNCH FOR IMPLANTING HAIR
Frank A. Bellantoni, 101 Helena Ave., Yonkers, N.Y. 10710
Filed Apr. 6, 1970, Ser. No. 22,264
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—12



220,988
JEWELRY BOX
Jacqueline Rosenbluth, 302 E. 18th St., New York, N.Y. 10003
Filed Dec. 23, 1969, Ser. No. 20,611
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1



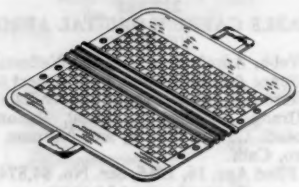
220,989
**STORAGE CARRYING CASE FOR MAGNETIC TAPE CARTRIDGES**
Albert A. Di Iola, 401 County Line Road, Huntington Valley, Pa. 19006
Filed Feb. 3, 1970, Ser. No. 21,242
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



220,990
**UMBRELLA HANDLE**
Richard Zimmermann, Leichlingen, Rhineland, Germany, assignor to W. Bauermann & Soehne G.m.b.H., Hilden, Rhineland, Germany
Filed Aug. 26, 1969, Ser. No. 18,858
Claims priority, application Germany Mar. 6, 1969
Term of patent 14 years
U.S. Cl. D88—3
Int. Cl. D3—*03*

220,991
**SUN SHADE**
Mildred Smith Riley, 2735 NE. 14th St., Fort Lauderdale, Fla. 33304
Filed May 21, 1970, Ser. No. 23,084
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3

220,992
**SLEEPING BAG CARRIER**
Wanda L. Hepper, Rte. 2, Meridian, Ohio 83642
Filed Feb. 25, 1970, Ser. No. 21,609
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



# LIST OF PATENTEES

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## PATENTS WERE ISSUED ON THE 22D DAY OF JUNE, 1971

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Buttner, Artur, to Heidelberger Druckmaschinen Aktiengesellschaft. Prestacking device for printing press sheet feeding apparatus. 3,586,177, Cl. 214-6.

Buu-Hoi, Nguyen Phuc; Lambelin, Georges Emile; Gillet, Claude Leon; Thiriaux, Jacques Emile; and Mees, Georges Joseph, to Madan AG. Amides and N-hydroxyamides of substituted arylacetic acids and corresponding salts. 3,586,713, Cl. 260-500.5

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Byrne, Edward R.; and Reith, Robert A., to Bell Telephone Laboratories, Incorporated. Scheme allowing real time alteration of a data processing system operating strategy. 3,587,054, Cl. 340-172.5

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Caiola, Robert J., to Dow Chemical Company, The. Sealing of surface sulfonated plastic shaped articles. 3,586,569, Cl. 156-308.

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Daniels, Moses B., Jr., to Texaco Inc. Automatic dispensing nozzle. 3,586,070, Cl. 141-128.

Danielsson, Tore Lennart. Material spreading apparatus. 3,585,912, Cl. 94-46.

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Das, Mukunda Behari; and Josephy, Richard Downing, to U.S. Philips Corporation. High frequency, high power igfet with interdigital electrodes and plural looped gate. 3,586,930, Cl. 317-235.

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Dechantsretter, Max J., to Harnischfeger Corporation. Anti-friction bearing support means for a crane having an extensible slide or the like. 3,586,194, Cl. 214-730.

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De Koning, Jan, to N.V. Ingenieursbureau voor Systemen en Octrovien Spanstaal. Method and apparatus for suction dredging. 3,585,738, Cl. 37-57.

De Koning, Jan, to N.V. Ingenieursbureau voor Systemen en Octrovien Spanstaal. Method and suction dredging installation for obtaining sand. 3,585,739, Cl. 37-58.

De Koning, Jan; and Wolters, Tjako Aaldrik, to N.V. Ingenieursbureau voor Systemen en Octrovien Spanstaal. Method and suction dredging installation for sucking up dredging spoil. 3,585,740, Cl. 37-63.

De La Forest Divonne, Andre: *See—*
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Del Carlo, Carlo; and Jenkin, Keith R., to Speedring Corporation. Electrolytic pump operated gas bearing. 3,586,435, Cl. 350-7.

De Leo, Richard V.; and Hagen, Floyd W., to Rosemount Engineering Company. Aerodynamically compensated static pressure tube. 3,585,859, Cl. 73-388.

Delliyes, Roland, to Societe Anonyme: Ciments Laforge. Continuous sampling apparatus for divided materials. 3,585,864, Cl. 73-424.

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DeLuccia, John J., to United States of America, Navy. High hydrostatic pressure electrochemical cell. 3,586,617, Cl. 204-195.

De Mey, Charles F., II, to Perkin-Elmer Corporation, The. Variable rate angular drive mechanism for a diffraction grating. 3,586,440, Cl. 356/74.

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De Pauw, Richard A.; and Knapp, William H., to International Harvester Company. Rotor knife attachment. 3,586,004, Cl. 130-27.

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De Simone, Jean-Claude: *See—*
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Dickson, Rufus F.; and Funder, Lawrence C. Retractable load cover for a vehicular container. 3,586,365, Cl. 296-137.

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Dietz, Daniel N., to Shell Oil Company. Method for recovering salt from a subsurface earth formation by solution mining. 3,586,378, Cl. 299-5.

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Fleissner, Heinz, to Vepa AG. Apparatus for treating textile material. 3,585,733, Cl. 34-115.
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**Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.**

Chechak, Jonas J. Image transfer process. T887,027, 6–22–71, Cl. 96—1.4

Clark, Raymond D. Preparation of bis(chloroformates) of 2,2,4,4-tetraalkyl-1,3-cyclobutanediols. T887,023, 6–22–71, Cl. 260—463.

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Ford, John A., Jr., and J. F. Stenberg, to Eastman Kodak Co. Optical brightening compositions. T887,030, 6–22–71, Cl. 96—82.

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Rawson, Paul O., Jr., Valbona, and Hamilton. 220,970.
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Webb, James E., administrator of the National Aeronautics and Space Administration, with respect to an invention of H. S. Becker, S. Enzer, W. H. Hand, P. Rosati, and N. C. Surtees. Two-stage aerospace vehicle. 220,981, 6–22–71, Cl. D71—1.
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Webb, James E., administrator of the National Aeronautics and Space Administration, with respect to an invention of H. S. Becker, S. Enzer, W. H. Hand, P. Rosati, and N. C. Surtees. Reuseable carrier-orbital aerospace vehicle. 220,985, 6–22–71, Cl. D71—1.
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## Design Patents

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## Defensive Publications Applications

(Notice of Dec. 16, 1969, 869 O.G. 687)

26 : T887,026
36 : T887,017
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36 : T887,020
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36 : T887,029
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42 : T887,028
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97 : T887,018

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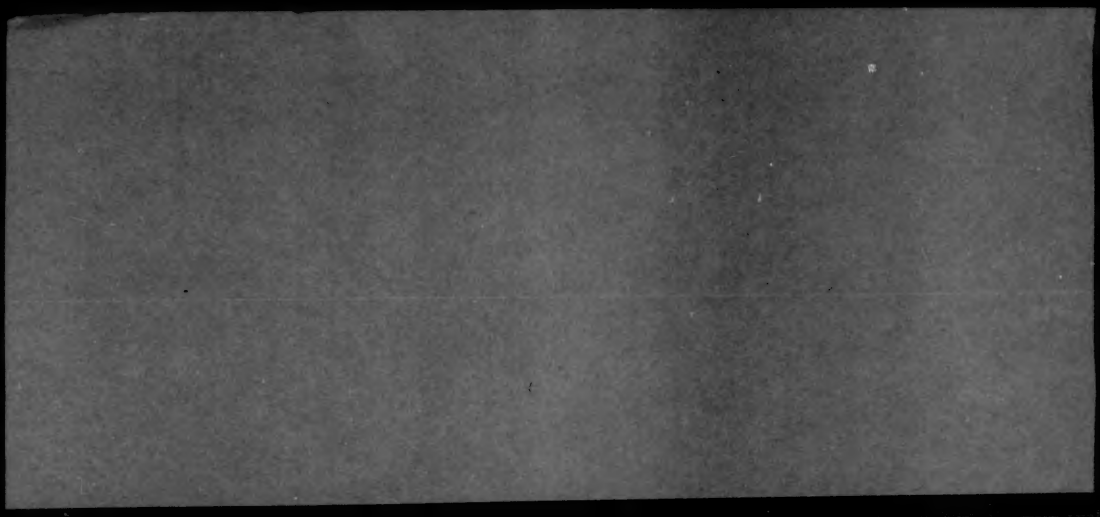

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Maurice H. Stans, *Secretary*

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William E. Schuyler, Jr., *Commissioner*